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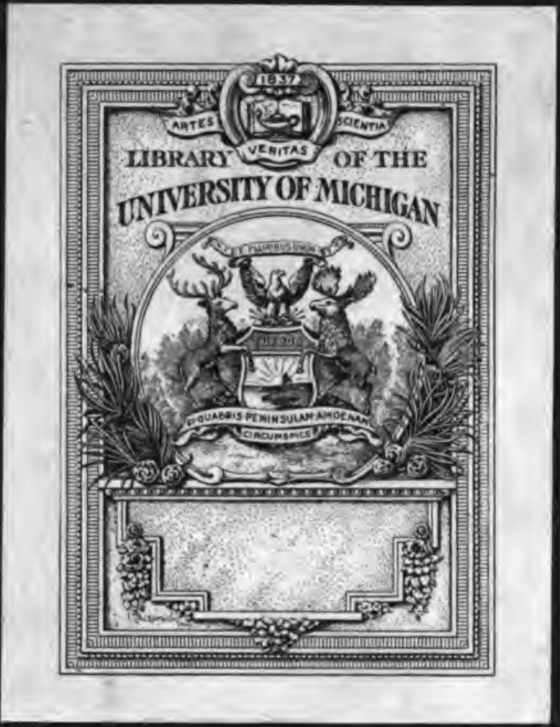

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KANSAS

HORTICULTURAL REPORT,

FOR THE YEAR 1880.

CONTAINING THE

PROCEEDINGS OF THE STATE HORTICULTURAL SOCIETY AT ITS TENTH
SEMI-ANNUAL MEETING, HELD AT HUTCHINSON, RENO COUNTY,
JUNE 1, 2 AND 3, AND THE FOURTEENTH ANNUAL MEETING, HELD AT WYANDOTTE, WYANDOTTE COUNTY,
DECEMBER 14, 15 AND 16, 1880.

EDITED BY THE SECRETARY.

VOL. X.

PUBLISHED BY THE SOCIETY.

1869.

TOPEKA, KANSAS:
GEO. W. MARTIN, KANSAS PUBLISHING HOUSE.
1881.

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FRUIT DISTRICTS.

1.—NORTHERN DISTRICT.

(Embraces the following counties.)

ATCHISON,
BROWN,
CLAY,
CLOUD,
DAVIS,
DICKINSON,
DONIPHAN,
ELLIS,
ELLSWORTH,
JACKSON,
JEWELL,
JEFFERSON,
LEAVENWORTH,
LINCOLN,
MARSHALL,
MITCHELL,
NEMAHA,
OSBORNE,
POTTAWATOMIE,
PHILLIPS,
REPUBLIC,
RILEY,
ROOKS,
RUSSELL,
SALINE,
SHAWNEE,
SMITH,
TREGO,
WASHINGTON,
WYANDOTTE.

NO. 2.—CENTRAL DISTRICT.

(Embraces the following counties.)

ANDERSON,
BARTON,
CHASE,
COFFEY,
DOUGLAS,
EDWARDS,
FRANKLIN,
HARVEY,
HODGEMAN,
JOHNSON,
LINN,
LYON,
MARION,
MIAMI,
MORRIS,
McPHERSON,
OSAGE,
PAWNEE,
RENO,
RICE,
RUSH,
WABAUNSEE.

NO. 3.—SOUTHERN DISTRICT.

(Embraces the following counties.)

ALLEN,
BARBOUR,
BOURBON,
BUTLER,
CHAUTAUQUA,
CHEROKEE,
COMANCHE,
COWLEY,
CRAWFORD,
ELK,
FORD,
GREENWOOD,
HARPER,
KINGMAN,
LABETTE,
MONTGOMERY,
NEOSHO,
SEDGWICK,
SUMNER,
WILSON,
WOODSON.

OFFICERS AND STANDING COMMITTEES FOR 1881.

OFFICERS.

President,
PROF. E. GALE, MANHATTAN, RILEY COUNTY.

Vice President,
M. B. NEWMAN, WYANDOTTE, WYANDOTTE COUNTY.

Secretary,
G. C. BRACKETT, LAWRENCE, DOUGLAS COUNTY.

Treasurer,
F. WELLHOUSE, FAIRMOUNT, LEAVENWORTH COUNTY.

Trustees,
C. H. GRAHAM, LEROY, COFFEY COUNTY; GEO. Y. JOHNSON, LAWRENCE, DOUGLAS COUNTY; DR. CHAS. WILLLIAMSON, WASHINGTON, WASHINGTON COUNTY.

STANDING COMMITTEES.

Nomenclature,
H. E. VAN DEMAN, GENEVA.

Botany and Vegetable Physiology,
J. W. ROBSON, CHEEVER.

Entomology,
PROF. F. H. SNOW, LAWRENCE.

Orchard Culture,
F. WELLHOUSE, FAIRMOUNT.

Forestry,
MARTIN ALLEN, HAYS CITY.

Small Fruits,
E. J. HOLMAN, LEAVENWORTH.

Floriculture,
Native, G. Y. JOHNSON, LAWRENCE; Domestic, DR. CHAS. WILLIAMSON, WASHINGTON.

Vegetable Gardening,
GEO. W. ASHBY, CHANUTE.

Handling Fruits,
C. G. WICKERSHAM, PARSONS.

Meteorology,
PROF. F. HAWN, LEAVENWORTH.

Vine Culture,
E. P. DEIHL, OLATHE.

Landscape Gardening,
MISS M. L. MACY, LAWRENCE.

Horticulture Connected with Farming,
CHAS. W. MURTFELDT, ST. LOUIS, MO.

LIST OF MEMBERS.

HONORARY MEMBERS.

(Enrolled in the order of admission.)

N. J. COLMAN,	*St. Louis, Mo.*
DR. L. D. MORSE,	*St. Louis, Mo.*
C. W. MURTFELDT,	*St. Louis, Mo.*
WM. KING,	*St. Louis, Mo.*
DR. JNO. A. WARDER,	*Cleves, Ohio.*
PROF. C. V. RILEY,	*Washington, D. C.*
PROF. JNO. H. TICE,	*St. Louis, Mo.*
SAMUEL MILLER,	*Bluffton, Mo.*
PROF. S. T. KELSEY,	*Highlands, N. C.*

LIFE MEMBERS.

(In the order and year enrolled.)

G. C. BRACKETT,	*Lawrence,*	1868
DR. WM. M. HOWSLEY, (dec.,)	*Leavenworth,*	1875
C. G. WICKERSHAM,	*Parsons,*	1876
DR. J. M. DEBALL,	*Fontana,*	1876
PROF. E. GALE,	*Manhattan,*	1876
H. E. VAN DEMAN,	*Geneva,*	1876
SECRETARY'S OFFICE, MANHATTAN HORTICULTURAL SOCIETY,		1876
FRED. WELLHOUSE,	*Fairmount,*	1877
ABNER ALLEN,	*Wabaunsee,*	1877
SECRETARY'S OFFICE, JOHNSON CO. HORTICULTURAL SOCIETY,		1877
GEO. Y. JOHNSON,	*Lawrence,*	1878
ROBT. MILLIKEN,	*Emporia,*	1878
A. A. ADAMS,	*Garnett,*	1878
W. E. FOSNOT,	*Ellsworth,*	1878
DR. J. STAYMAN,	*Leavenworth,*	1879
A. N. GODFREY,	*Madison,*	1879
J. A. MOSHER,	*Belleville,*	1879
E. P. DEIHL,	*Olathe,*	1880
JAS. MARVIN, D. D., State University,	*Lawrence,*	1880
HON. T. C. HENRY,	*Abilene,*	1880
GEO. T. FAIRCHILD, A. M., Agricultural College,	*Manhattan,*	1880

MEMBERS FOR 1881.

ALLEN, M., *	*Hays City.*
ASHBY, G. W., *	*Chanute.*
BAILEY, A. D., *	*Wakeeney.*
BARNETT, W. D., *	*Holton.*
BEEGLE, E. S., *	*Clay Center.*
BOHRER, DR. G., †	*Raymond.*
BISHOP, L., *	*Osawatomie.*
BOGGS, THEO., *	*McPherson.*
BROWN, G. B., *	*Guilford.*
BUCKMAN, THOS., *	*Topeka.*
BUNN, BURR H., *	*Rush Center.*
CARPENTER, C. H., †	*Wyandotte.*
CHEVALIER, C. C., *	*Garfield.*
COOK, THOS. F., *	*Monrovia.*
CORBETT, J. B., *	*Bunker Hill.*
CRUST, B. M.,	*Stanley.*
CUTTER, WM., *	*Junction City.*
DAVIS, P.,	*Parsons.*
DETHERIDGE, I., *	*Fame.*
DICKINSON, W. W., *	*Wyandotte.*
DIMOCK, A. S., *	*Hutchinson.*
EDGERLY, S. J., *	*Seneca.*
ELLIS, A., *	*Elk City.*
FOSTER, J. S., *	*Jewell City.*
FULLER, P. W., *	*Hiawatha.*
GILLETT, A. R., †	*Winfield.*
GRAHAM, C. H., *	*Leroy.*
HALL, J. N., *	*Oskaloosa.*
HALL, M., *	*Newton.*
HARMAN, J. P., *	*Vesper.*
HARRIS, F. B., *	*White City.*
HATCH, S., *	*Wathena.*
HAWTHORNE, D. C.,	*Leavenworth.*
HOLMAN, E. J., *	*Leavenworth.*
JONES, W. D., *	*Barclay.*
KANE, JAS.,	*Lawrence.*
KELSEY, C. C., *	*Humboldt.*
KNAPP, V. Y.,	*Parsons.*
LATIMER, J. W., *	*Pleasanton.*
LEACH, L. W., *	*Kingman.*

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* County Vice President. † Delegate.

LEWIS, W. A., *	*Russell.*
LITSON, W. H., *	*Benton.*
MANLOVE, J. D., *	*Fort Scott.*
MARSTON, C. W., †	*Princeton.*
MAXWELL, W., *	*Edgerton.*
McFARLAND, B. S., †	*Olathe.*
McKEE, JOHN, *	*Marysville.*
McCRACKEN, WM., *	*Sunny Dale.*
McFEELY, JAS. J.,	*Parsons.*
McLAREN, J. W., *	*Summerville.*
MEIXELL, W.,	*Parsons.*
MOHLER, M., *	*Osborne City.*
MULLANEY, J. F., *	*Stockton.*
NICOLL, J., *	*Speareville.*
NORTHRUP, H. A., *	*Salina.*
OBENDORF, J. A.,	*Centralia.*
PEARSON, S. W., *	*Lawrence.*
PIERSON, T. M.,	*Lawrence.*
PIERSON, J. J.,	*Parsons.*
PING, THOS., *	*Girard.*
PLANK, E. N., †	*Independence.*
POPENOE, PROF. E. A., *	*Manhattan.*
PRESCOTT, J. B., *	*Pierceville.*
RICHMOND, R. A., *	*Star.*
ROBORDS, C. I.,	*Hudson, Mo.*
ROBSON, J. W., *	*Cheever.*
SAGER, E. H.,	*Wyandotte.*
SAMPSON, J. G., *	*El Paso.*
SCHLICHTER, J. B., *	*Sterling.*
SHEFFIELD, C. H., *	*Glasco.*
SIDWELL, A. M., †	*Girard.*
SMITH, T. W., *	*Baxter Sp'gs.*
SMITH, W. W., *	*Neosho Falls.*
SMITH, A. C. *	*Wellington.*
STILES, H. A., *	*Pavilion.*
STOUT, X. K., †	*Troy.*
TAYLOR, E. A., *	*Beloit.*
TEMPEST, P., *	*Whitfield.*
VAN DOREN, J., *	*Winfield.*
VINCENT, J. C.,	*Lecompton.*
WALKER, L. A., *	*Independence.*
WATT, D. G., †	*Lawrence.*
WAUGH, G. M.,	*Gardner.*
WELSH, H. P., *	*Ottawa.*
WELTY, HENRY, *	*Elk Falls.*
WILLIAMS, J. W., *	*Cope.*
WILLIAMS, J. L., *	*Oswego.*
WILLIAMSON, DR. CHAS., *	*Washington.*
WILLIS, A., †	*Ottawa.*

*County Vice President. †Delegate.

DELEGATES AT THE FOURTEENTH ANNUAL MEETING.

SOUTHEASTERN HORTICULTURAL SOCIETY,	H. E. Van Deman, Pres.,	*Geneva.*
	C. H. Graham,	*Leroy.*
COWLEY COUNTY HORTICULTURAL SOCIETY,	A. R. Gillett,	*Winfield.*
CRAWFORD COUNTY HORTICULTURAL SOCIETY,	A. M. Sidwell, Pres.,	*Girard.*
	W. J. Eldridge, Treas.,	*Girard.*
DONIPHAN COUNTY HORTICULTURAL SOCIETY,	X. K. Stout, President,	*Troy.*
	S. Hatch, Secretary,	*Wathena.*
DOUGLAS COUNTY HORTICULTURAL SOCIETY,	D. G. Watt, President,	*Lawrence.*
	E. A. Coleman, V. Pres.,	*Lawrence.*
	Sam. Reynolds, Sec'y,	*Lawrence.*
	O. H. Ayer, Treasurer,	*Lawrence.*
	Jas. Marvin, Chan. Univ.,	*Lawrence.*
	Jos. Savage,	*Lawrence.*
	T. M. Pierson,	*Lawrence.*
	S. W. Pearson,	*Lawrence.*
	Jas. Kane,	*Lawrence.*
	J. C. Vincent,	*Lecompton.*
	Lady Delegates:	
	Mrs. O. H. Ayer,	*Lawrence.*
	Mrs. E. A. Coleman,	*Lawrence.*
	Mrs. G. C. Brackett,	*Lawrence.*
	Mrs. J. C. Vincent,	*Lecompton.*
	Miss M. L. Macy,	*Lawrence.*
DICKINSON COUNTY HORTICULTURAL SOCIETY,	J. W. Robson, Secretary,	*Cheever.*
FRANKLIN COUNTY HORTICULTURAL SOCIETY,	A. Willis, President,	*Ottawa*
	Jas. Robb,	*Ottawa.*
	Chas. W. Marston	*Princeton.*

[List of Delegates to Fourteenth Annual Meeting—Concluded.]

JACKSON COUNTY HORTICULTURAL SOCIETY,	J. W. Williams, Pres.,	*Cope.*
JOHNSON COUNTY HORTICULTURAL SOCIETY,	H. Perley, Pres.,	*Spring Hill.*
	B. S. McFarland, Sec'y,	*Olathe.*
	E. P. Deihl,	*Olathe.*
	Dr. B. M. Crust,	*Stanley.*
LEAVENWORTH COUNTY HORTICULTURAL SOCIETY,	E. J. Holman,	*Leavenworth.*
	Dr. J. Stayman,	*Leavenworth.*
	F. Wellhouse,	*Leavenworth.*
MANHATTAN HORTICULTURAL SOCIETY,	Prof. E. A. Popenoe, Sec.,	*Manhattan.*
MONTGOMERY COUNTY HORTICULTURAL SOCIETY,	E. N. Plank,	*Independence.*
NEMAHA COUNTY HORTICULTURAL SOCIETY,	S. J. Edgerly, Pres.,	*Seneca.*
POTTAWATOMIE COUNTY HORTICULTURAL SOCIETY,	J. J. Measer, Sec'y,	*Vienna.*
RICE COUNTY HORTICULTURAL SOCIETY,	J. B. Schlichter, Pres.,	*Sterling.*
	Dr. G. Bohrer,	*Raymond.*
WABAUNSEE COUNTY HORTICULTURAL SOCIETY,	Abner Allen, Pres.,	*Wabaunsee.*
WASHINGTON COUNTY HORTICULTURAL SOCIETY,	Dr. C. Williamson, Pres.,	*Washington.*
WYANDOTTE COUNTY HORTICULTURAL SOCIETY,	C. H. Carpenter,	*Wyandotte.*
	D. B. Hiatt,	*Wyandotte.*

In addition to the Delegates from the Societies, the following counties were represented:

ALLEN,	—— Stewart,	*Humboldt.*
CLAY,	H. W. Smith,	*Exeter.*
DAVIS,	Wm. Cutter,	*Junction City.*
ELLIS,	M. Allen,	*Hays City.*
ELLSWORTH,	W. E. Fosnot,	*Ellsworth.*
GREENWOOD,	A. N. Godfrey,	*Madison.*
LABETTE,	C. G. Wickersham,	*Parsons.*
RUSH,	Burr H. Bunn,	*Rush Center.*

CERTIFICATE OF INCORPORATION.

We, the undersigned citizens of Kansas, do hereby associate ourselves as a body corporate, to be known as the KANSAS STATE HORTICULTURAL SOCIETY, for the promotion of horticulture and pomological science in the State of Kansas.

The principal office or place of business of said Society shall be at the city of Lawrence, or such other place in the State of Kansas as the Society may designate at a regular meeting thereof.

The number of Trustees of said Society shall be seven, and such Trustees shall have power to make all necessary rules and by-laws for the government of said Society and the transaction of its business.

Said Society shall have succession, under the provisions of this charter and the laws of the State of Kansas, for the term of nine hundred and ninety-nine years.

In witness of all which, we have hereunto set our hands and seals, at the city of Ottawa, in the county of Franklin, in said State of Kansas, this fifteenth day of December, A. D. 1869.

WM. TANNER, *Leavenworth.*
C. B. LINES, *Wabaunsee.*
WM. M. HOWSLEY, *Leavenworth.*
S. T. KELSEY, *Pomona.*
G. C. BRACKETT, *Lawrence.*
GEO. T. ANTHONY, *Leavenworth.*
J. STAYMAN, *Leavenworth.*

STATE OF KANSAS,
COUNTY OF DOUGLAS, } ss.

On this 15th day of December, 1869, before me, a notary public in and for said county, came William Tanner of Leavenworth county, Charles B. Lines of Wabaunsee county, William M. Howsley of Leavenworth county, S. T. Kelsey of Franklin county, George C. Brackett of Douglas county, George T. Anthony of Leavenworth county, J. Stayman of Leavenworth, to me personally known to be the identical persons described in and who signed the above charter, and acknowledged the same to be their own act and deed for the purposes therein.

JAMES CHRISTIAN,
Notary Public, Douglas County.

[SEAL.]

I, W. H. Smallwood, Secretary of the State of Kansas, do hereby certify that the foregoing is a true and correct copy of the original certificate of incorporation, filed in my office December 20, A. D. 1869.

In testimony whereof, I have hereunto subscribed my name and affixed the great seal of the State. Done at Topeka, this twenty-ninth day of August, A. D. 1871.

{ GREAT SEAL OF KANSAS. }

W. H. SMALLWOOD, *Secretary of State.*

CONSTITUTION.

ARTICLE I. This association shall be known as the KANSAS STATE HORTICULTURAL SOCIETY.

ART. II. Its object shall be the advancement of the science and art of horticulture.

ART. III. Its membership shall consist of annual members, paying an annual fee of one dollar; of life members, paying a fee of ten dollars at one time; and of honorary members, who shall be persons only of distinguished merit in horticulture, and shall be elected to membership by a vote of the Society.

ART. IV. Its officers shall consist of a President, Vice President, Secretary and Treasurer, who shall be elected by ballot at each annual meeting of the Society, and shall hold their office for the term of one year or until their successors shall be elected. They shall perform the duties usually devolving upon such officers, and shall be *ex officio* members of the Board of Trustees, consisting of the above-named officers and three other members, who shall be elected and hold their term of office as the other officers. Said Board shall, under the direction of the Society, manage all its affairs.

ART. V. It shall hold an annual meeting in the month of December, and a semi-annual meeting in the month of June, at such time and place as the Society or Board of Trustees may direct.

ART. VI. This Constitution may be amended at any annual meeting of the Society, by a two-thirds vote of the members present.

The following was adopted as an additional article, at the Seventh Annual Meeting, Dec. 2, 1873:

ART. VII. There shall be a Vice President annually appointed from each county in the State, whose duty it shall be to organize local horticultural societies in their respective counties, whenever practicable; to report at each annual meeting on the general subject of fruit culture in their respective counties; and to look after the general interests of horticulture in their particular localities.

AMENDMENTS.

Art. III was amended at the Fifth Annual Meeting, Dec. 19, 1871, by the following resolution:

Resolved, That article three of the Constitution be so amended that all annual memberships shall expire on the morning of the second day of the next annual meeting, and all semi-annual memberships shall expire on the morning of the second day of the next semi-annual meeting.

Also amended at the Ninth Annual Meeting, December 15, 1875, so as to read:

Ladies attending the meetings of the Society may become members without fee; and two delegates from each of the district horticultural societies, and one delegate from other auxiliary horticultural societies organized under the general statutes of the State of Kansas, attending the meetings of this Society, shall be entitled to a membership without payment of the usual fee.

Also amended at the Tenth Annual Meeting, December 5, 1876, so as to read:

Of life members, paying a fee of ten dollars in four annual installments of two dollars and a half each.

Also, the following additional provision:

That the office of secretary of any district, county and local horticultural society may be made a perpetual membership, upon the terms provided for a life-membership.

At the Thirteenth Annual Meeting, December 16, 1879, Art. III was amended as follows:

That any person who shall have performed the duties of a County Vice President under the provisions of Art. VII of the Constitution for one year, shall be enrolled an annual member; and that when such services shall have been rendered for the term of ten years, consecutive or otherwise, such person shall be enrolled as a life member, and entitled to all the benefits of such membership.

STATE LAWS.

BIRD LAW OF 1881.

AN ACT for the protection of birds, and to repeal chapter 118 of the Session Laws of 1877.

Be it enacted by the Legislature of the State of Kansas:

SECTION 1. That chapter 118 of the Session Laws of 1877 be and the same is hereby repealed.

SEC. 2. That it shall be unlawful for any person or persons at any time to catch, kill, trap, net or ensnare, or to pursue with such intent, or to have in his or her possession, either dead or alive, any wild bird except the wild goose, duck, hawk, crow, owl, snipe, curlew, plover, sand piper, bittern, heron, and crane; and any person or persons violating the provisions of this act shall be fined in any sum not less than ten dollars nor more than thirty dollars for each and every offense, such fine to be recovered in any court of competent jurisdiction in the county in which the offense was committed, one-half of such fine to go to the person giving information and making a complaint under this act: *Provided*, That it shall not be unlawful for persons to shoot and possess in such manner prairie chickens, between the first day of September and the first day of December in each year, and quail between the first day of November and the first day of January following: *And provided further*, That it shall not be necessary on the trial of any action or prosecution under this act, to prove the true name of the bird caught, killed, trapped, netted, ensnared or in possession as stated above, it being sufficient to show that a wild bird other than those excepted was caught, killed, trapped, netted or ensnared by the defendant or defendants, or in possession of the defendant or defendants.

SEC. 3. The provisions of this act shall not apply to any person who shall kill or catch any wild bird or birds for the sole purpose of preserving them as specimens for scientific purposes: *Provided*, That in a prosecution for the violation of any of the provisions of this act, it shall not be necessary for the prosecution to prove that the killing or catching of any wild bird was not done for scientific purposes.

SEC. 4. This act shall take effect and be in force from and after its publication in the official State paper.

Approved March 5, 1881.

KANSAS STATE HORTICULTURAL SOCIETY—APPROPRIATIONS.

AN ACT making appropriations to the State Horticultural Society for the fiscal years ending June 30, 1882, and June 30, 1883.

Be it enacted by the Legislature of the State of Kansas:

SECTION 1. That the sum of four thousand five hundred dollars is hereby appropriated out of any moneys in the treasury not otherwise appropriated, to the State Horticultural Society, to be expended in defraying the expense of publication of three thousand five hundred copies of the proceedings, and other expenditures of the Society for the fiscal year ending June 30, 1882: *Provided*, That the proceedings of said Society be tabulated, arranged, revised and fully prepared by the Secretary of said Society for publication, and be distributed to the public by the Secretary by sending ten copies to each member of the Legislature and the balance to the several counties of this State, according to population, without expense to the State. That the further sum of four thousand five hundred dollars be and the same is hereby appropriated out of any money in the treasury not otherwise appropriated, for defraying the expense of publication of three thousand five hundred copies of the proceedings and other expenditures of the Society for the fiscal year ending June 30, 1883.

Sec. 2. The Auditor of State is hereby authorized to issue his warrants on the Treasurer of State for the purposes and amounts specified in section one of this act.

Sec. 3. This act shall take effect and be in force from and after its publication in the official State paper.

Approved March 3, 1881.

UNITED STATES LAWS RELATING TO HORTICULTURE.

[General nature—No. 105.]

An Act to encourage the growth of timber on western prairies.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That any person who shall plant, protect, and keep in a healthy, growing condition for ten years, forty acres of timber, the trees thereon not being more than twelve feet apart each way, on any quarter-section of any of the public lands of the United States, shall be entitled to a patent for the whole of said quarter-section at the expiration of said ten years, on making proof of such fact by not less than two credible witnesses: *Provided*, That only one quarter in any section shall be thus granted.

Sec. 2. That the person applying for the benefit of this act shall, upon application to the register of the land office in which he or she is about to make such entry, make affidavit before said register or receiver that said entry is made for the cultivation of timber, and upon filing such affidavit with said register and receiver, and on payment of ten dollars, he or she shall thereupon be permitted to enter the quantity of land specified: *Provided, however*, That no certificate shall be given or patent issued therefor until the expiration of at least ten years from the date of such entry; and if at the expiration of such time, or at any time within three years thereafter, the person making such entry, or if he or she be dead, his or her heirs, or legal representatives, shall prove by two credible witnesses that he, she or they have planted, and for not less than ten years have cultivated and protected, such quantity and character of timber as aforesaid, they shall receive the patent for such quarter-section of land.

Sec. 3. That if at any time after the filing of said affidavit, and prior to the issuing of the patent for said land, it shall be proven, after due notice to the party making the entry and claiming to cultivate such timber, to the satisfaction of the register of the land office, that such person has abandoned or failed to cultivate, protect and keep in good condition such timber, then, and in that event, said land shall revert to the United States.

Sec. 4. That each and every person who, under the provisions of an act entitled "An act to secure homesteads to actual settlers on the public domain," approved May twentieth, eighteen hundred and sixty-two, or any amendment thereto, having a homestead on said public domain, who, at the end of the third year of his or her residence thereon, shall have had under cultivation, for two years, one acre of timber, the trees thereon not being more than twelve feet apart each way, and in a good, thrifty condition, for each and every sixteen acres of said homestead, shall, upon due proof of said fact by two credible witnesses, receive his or her patent for said homestead.

SEC. 5. That no land acquired under provisions of this act shall, in any event, become liable to the satisfaction of any debt or debts contracted prior to the issuing of patent therefor.

SEC. 6. That the Commissioner of the General Land Office is hereby required to prepare and issue such rules and regulations, consistent with this act, as shall be necessary and proper to carry its provisions into effect; and that the registers and receivers of the several land offices shall be entitled to receive the same compensation for any lands entered under the provisions of this act that they are now entitled to receive, when the same quantity of land is entered with money.

SEC. 7. That the fifth section of the act entitled "An act in addition to an act to punish crimes against the United States, and for other purposes," approved March third, eighteen hundred and fifty-seven, shall extend to all oaths, affirmations and affidavits required or authorized by this act.

Approved March 3, 1873.

[GENERAL NATURE — No. 16.]

AN ACT to amend the act entitled "An act to encourage the growth of timber on western prairies."

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That the act entitled "An act to encourage the growth of timber on western prairies," approved March third, eighteen hundred and seventy-three, be and the same is hereby amended so as to read as follows: That any person who is the head of a family, or who has arrived at the age of twenty-one years, and is a citizen of the United States, or who shall have filed his declaration of intention to become such, as required by the naturalization laws of the United States, who shall plant, protect, and keep in a healthy growing condition for eight years, forty acres of timber, the trees thereon not being more than twelve feet apart each way, on any quarter-section of any of the public lands of the United States, or twenty acres on any legal subdivision of eighty acres, or ten acres on any legal subdivision of forty acres, or one-fourth part of any fractional subdivision of land less than forty acres, shall be entitled to a patent for the whole of said quarter-section, or of such legal subdivision of eighty or forty acres, or fractional subdivision of less than forty acres, as the case may be, at the expiration of said eight years, on making proof of such fact by not less than two credible witnesses: *Provided,* That not more than one-quarter of any section shall be thus granted, and that no person shall make more than one entry under the provisions of this act, unless fractional subdivisions of less than forty acres are entered, which in the aggregate shall not exceed one quarter-section.

SEC. 2. That the person applying for the benefit of this act shall, upon application to the register of the land district in which he or she is about to make such entry, make affidavit before the register, or the receiver, or some officer authorized to administer oaths in the district where the land is situated, who is required by law to use an official seal, that said entry is made for the cultivation of timber, and upon filing said affidavit with said register and said receiver, and on payment of ten dollars, he or she shall thereupon be permitted to enter the quantity of land specified; and the party making an entry of a quarter-section under the provisions of this act shall be required to break ten acres of the land covered thereby the first year, ten acres the second year, and twenty acres the third year after the date of entry, and to plant ten acres of timber the second year, ten acres the third year, and twenty acres the fourth year after date of entry. A party making an entry of eighty acres shall break and plant, at the times hereinbefore prescribed, one-half of the quantity required of a party who enters a quarter-section, and a party entering forty acres shall break and plant, at the times hereinbefore prescribed, one-quarter of the quantity required of a party who enters a quarter-section, or a proportionate quantity for any smaller fractional subdivision: *Provided, however,* That no final certificate shall be given or patent issued for the land so entered until the expiration of eight years from the date of such entry; and if at the expiration of such time, or at any time within five years thereafter, the person making such entry, or if he or she be dead, his or her heirs or legal representatives, shall prove, by two credible witnesses, that he, or she, or they have planted, and for not less than eight years have cultivated and protected such quantity and character of timber as aforesaid, they shall receive a patent for such quarter-section or legal subdivision of eighty or forty acres of land, or for any fractional quantity of less than forty acres, as herein provided. And in case of the death of a person who has complied with the provisions of this act for the period of three years, his heirs or legal representatives shall have the option to comply with the provisions of this act, and receive at the expiration of eight years a patent for one hundred and sixty acres, or receive without delay a patent for forty acres, relinquishing all claim to the remainder.

SEC. 3. That if at any time after the filing of said affidavit, and prior to the issuing of the patent for said land, the claimant shall abandon the land or fail to do the breaking and planting required by this act, or any part thereof, or shall fail to cultivate, protect and keep in good condition such timber, then, and in that event, such land shall be subject to entry under the homestead laws, or by some other person under the provisions of this act: *Provided,* That the party making claim to said land, either as a homestead settler or under this act, shall give, at the time of filing his application, such notice to the original claimant as shall be prescribed by the rules established by the Commissioner of the General Land Office, and the rights of the parties shall be determined as in other contested cases.

SEC. 4. That each and every person who, under the provisions of the act entitled "An act to secure homesteads to actual settlers on the public domain," approved May twentieth, eighteen hundred and sixty-two, or any amendment thereto, having a homestead on said public domain, who, at any time after the end of the third year of his or her residence thereon, shall, in addition to the settlement and improvements now required by law, have had under cultivation, for two years, one acre of timber, the trees thereon not being more than twelve feet apart each way, and in good, thrifty condition, for each and every sixteen acres of said homestead, shall, upon due proof of such fact by two credible witnesses, receive his or her patent for said homestead.

SEC. 5. That no land acquired under the provisions of this act shall in any event become liable to satisfaction of any debt or debts contracted prior to the issuing of certificate therefor.

SEC. 6. That the Commissioner of the General Land Office is hereby required to prepare and issue such rules and regulations, consistent with this act, as shall be necessary and proper to carry its provisions into effect; and that the registers and the receivers of the several land offices shall each be entitled to receive two dollars at the time of entry, and the same sum when the claim is finally established and the final certificate issued.

SEC. 7. That the fifth section of the act entitled "An act in addition to an act to punish crimes against the United States, and for other purposes," approved March third, eighteen hundred and fifty-seven," shall extend to all oaths, affirmations and affidavits required or authorized by this act.

SEC. 8. That parties who have already made entries under the act approved March third, eighteen hundred and seventy-three, of which this is amendatory, shall be permitted to complete the same upon full compliance with the provisions of this act.

Approved March 13, 1874.

[PUBLIC—No. 71.]

AN ACT for the relief of certain settlers on the public lands.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be lawful for homestead and preëmption settlers on the public lands, or preëmption settlers on Indian reservations, where crops were destroyed or seriously injured by grasshoppers in the year eighteen hundred and seventy-seven, to leave and be absent from said lands until the first day of October, eighteen hundred and seventy-eight, under such rules and regulations as to proof of the same as the Commissioner of the General Land Office shall prescribe; and where such grasshoppers shall reappear in eighteen hundred and seventy-eight, to the like destruction or injury of crops, the right to leave and be absent as aforesaid shall continue to October first, eighteen hundred and seventy-nine; and during such absence no adverse rights shall attach to said lands, such settlers being allowed to resume and perfect their settlement as though no such absence had occurred.

SEC. 2. That the time for making final proof and payment by preëmptors whose crops have been destroyed or injured as aforesaid is hereby extended for one year after the expiration of the term of absence provided for in the first section of this act; and all the rights and privileges extended by this act to homestead and preëmption settlers shall apply to and include the settlers under an act entitled "An act to encourage the growth of timber on western prairies," approved March third, eighteen hundred and seventy-three, and the acts amendatory thereof.

Approved March 3, 1877.

BIOGRAPHICAL SKETCH OF PROF. WILLIAM K. KEDZIE.

THE distinguished and highly-esteemed gentleman, the subject of this sketch, was the oldest son of Prof. R. C. Kedzie, M. D., of Michigan Agricultural College, and Mrs. Eliza Fairchild Kedzie. He was born July 5, 1851, at Kalamazoo, Michigan, and graduated at the Michigan Agricultural College when about eighteen years old, after which he took an advanced course in chemistry at the Sheffield Scientific School of Yale College. He acted as an assistant to his father in the Michigan Agricultural College until he was chosen to fill the chair of Chemistry in the Kansas State Agricultural College, which he occupied during the term of five successive years. In 1875 he visited Europe, with the express purpose of examining the most successful and celebrated laboratories of Germany. As a result of the advantages obtained while in Europe, he was enabled to plan the laboratory of the Kansas State Agricultural College, in a manner difficult to be surpassed for the essential purposes for which it was designed.

At the solicitation of the Trustees of the Oberlin Institute, he resigned his position in the Kansas State Agricultural College, and immediately removed to Oberlin, and entered upon the work of the chemical department of that institution, which position he filled until his death, in April, 1880, at the age of 29 years.

Prof. Kedzie was eminently successful as a teacher, and at the earnest solicitation of others he prepared a work on Agricultural Geology, which was published in 1877. Both in Michigan and Kansas, he manifested a constant desire to make his chosen department of science bear upon the interests of horticulture, as his many very excellent addresses abundantly testify. Few have made so wide a place for themselves in the hearts and memory of their fellow-men, in so few years as did Prof. Wm. K. Kedzie, and by his death one of the brightest lights of the scientific world has gone out.

PROCEEDINGS

OF THE

TENTH SEMI-ANNUAL MEETING,

HELD AT HUTCHINSON, KANSAS,

TUESDAY, WEDNESDAY AND THURSDAY, JUNE 1, 2 AND 3, 1880.

NOTE.—The Society will not be held responsible for individual opinions.—SEC'Y.

The Society assembled in the M. E. Church, in Hutchinson, Reno county, on Tuesday, June 1, at 10 o'clock A. M., and came to order with President E. Gale in the chair.

The exercises opened with prayer by Rev. L. J. Templin, of the city.

COMMITTEE ON EXERCISES.

The President appointed L. J. Templin, L. Houk, of Hutchinson; J. B. Schlichter and Dr. G. Bohrer, of Rice county, to arrange a programme of exercises.

REPORTED CONDITIONS AND FRUIT PROSPECTS FOR 1880, BY COUNTIES.

DICKINSON COUNTY.

J. W. ROBSON, Cheever: Blackberries and raspberries will constitute the crop of fruit. All other classes were cut off by frosts, April 28th and 29th. Notwithstanding such a disaster, fruit planting has been more extensive than in any year previous.

SEDGWICK COUNTY.

WM. MCCRACKEN, Sunny Dale: Juneberry is a substitute for the currant; bears profusely. Cherry—The Plumstone Morello has always been productive.

—— **MCCARTY**: We will have some peaches, and abundant crops of grapes. Apple and pear trees set a full crop, but it was blown off by violent winds. Plums, a failure.

DAVIS COUNTY.

WM. CUTTER, Junction City: Apple, full crop, except Winesap, which, blooming early, was severely injured by frosts. Peaches, scattering. Pears, standard, full enough. The Transcendent crab, owing to its early blooming, is objectionable. Strawberries, small, owing to dry weather. Blackberries promise an abundant crop. Wood growth, good. We have no causes for discouragement. A northern protection has proven beneficial to fruit growers.

LEAVENWORTH COUNTY.

F. **WELLHOUSE**, Fairmount: Of apples, the Ben Davis (old trees), Missouri Pippin, Smith's Cider and Rawles Genet will have a full crop; Winesap, half a crop, compared with the product of 1877. My county will have two-thirds of a crop. Wood growth fine. Peaches, budded trees, light; seedlings, full crop. Cherry, one-fifth of a crop. Strawberries were materially reduced by dry weather. Raspberry and Blackberry, very promising.

RICE COUNTY.

J. H. **STUBBS**, Sterling: Grape vines are loaded with fruit. A native variety of currant succeeds; other fruits a failure. The apple-twig borer has been quite severe in my orchard.

J. B. **SCHLICHTER**, Sterling: Utah Hybrid cherry trees and blackberry and raspberry plants are loaded with fruit. I am satisfied that neither farming nor fruit growing will be successful in Rice county without the aid of windbreaks.

DR. G. BOHRER, Raymond: The apple-twig borer is present in my orchard. Its habit of cutting off limbs is no injury, as trees are generally benefited by such pruning.*

MR. SCHLICHTER: Never saw the potato beetle so numerous; one kind of potato, the Canada Red, is exempt from its attacks.

MONTGOMERY COUNTY.

L. A. **WALKER**, Independence: Grape crop was never heavier; other fruits will be half a crop.

RENO COUNTY.

A. M. **SWITZER**, Hutchinson: Orchard fruits are a failure. Strawberries can be grown in our valleys which will compare favorably with those grown in any other locality; cultivate thoroughly during the summer, and protect with mulching in winter. Blackberries a full, and raspberries and gooseberries not more than half a crop. The Turner raspberry has winter-killed. The mountain currant bears full every season. The Russian mulberry, both white and black, succeeds in this county; trees are dwarfs in habit; fruits at the age of three or four years from seed or layers; fruit a little under the size of the native red mulberry.

ALLEN COUNTY.

H. E. **VAN DEMAN**, Geneva: Apple, about half a crop. Rawles Genet, full crop. Peaches—Early Louise, very full of fruit; of all varieties will have a half-crop. Pears, a good crop. Cherry—Early Richmond trees full of fruit. Small fruits abundant; the blackberry crop will be immense; Juneberry, bearing profusely. Rose chafer, so very annoying in past years, is gradually disappearing. Canker worm has stripped the leaves from an orchard near me this season.

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*The evidence proved the insect to be the twig pruner, and not the apple-twig borer.—SEC'Y.

LYON COUNTY.

Robt. Milliken, Emporia: The Colorado potato beetle has been very destructive to the potato crop in some localities.

J. M. Miller, Emporia: Apple—The crop was seriously injured by frosts; will be about one-fourth a yield. Peach, light. Blackberry and grape, heavy.

DOUGLAS COUNTY.

Geo. Y. Johnson, Lawrence: Apples—Rawles Genet, Ben Davis, Rambo and Kansas Keeper trees are bearing full in the eastern half of the county; Winesap, White Winter Pearmains, and others, much lighter; some varieties are dropping, probably caused by dry weather. Cherries, fair; raspberries and blackberries, full crop.

JOHNSON COUNTY.

E. P. Deihl, Olathe: Apple crop is a fair one. The Wagener, Rawles Genet, Winesap and Missouri Pippin trees are very full. Peaches—Amsden's June, Early Beatrice and Hale's Early trees are full of fruit. Cherries, raspberries and blackberries, full crop. Pears, in orchards where trees are healthy, full crop.

WYANDOTTE COUNTY.

M. B. Neuman, Wyandotte: Fruit prospects very encouraging. Cherry and all classes of small fruits are very productive this season.

GREENWOOD COUNTY.

A. N. Godfrey, Madison: Apples—Rawles Genet, Wagener and Willow Twig, productive. Peaches, full. Cherries, light. All classes of small fruits are bearing well. Grapes are rather scattering on the bunches.

REPORT OF COMMITTEE ON EXERCISES.

Morning sessions to open at 9 and close at 12 o'clock; afternoon sessions to open at 2 and close at 5 o'clock; evening sessions to open at 8 and close at 10 o'clock, each day.

Adjourned.

AFTERNOON SESSION.

Tuesday, June 1, 1880.

President E. Gale in the chair. Exercises opened with music.

DISCUSSION—PEACH CULTURE.

H. E. Van Deman: The peach is second only to the apple in its relations to the fruit interests. It is so easily propagated and grown, comes into bearing so young, its cheapness, and the range of its season, make it among the most desirable of fruits. It is so successful in the eastern counties of Kansas, that some years large amounts rot under the trees. The planting of seeds is advisable (as all the fine varieties originated thus), with a view to obtain valuable varieties, of Kansas origin, which may prove to be better adapted to the conditions of our climate and soil than many we are now using. I prefer the following varieties, in the order named: Alexander, Early Beatrice, Early Louise (the most productive), Early Rivers, Large Early York, Old Mixon Free (unsurpassed in quality), Yellow Rareipe (excellent quality and productive); Indian Blood Cling and Morris White are fine for late canning; the Steadley is a large, late freestone; Bilyeu's Late is the best very late variety. Washes and ashes are not a reliable prevention for the attacks of the borer. Application of tar has also failed. Wraps of tarred paper may form a partial protection, but in all treatments an after-examination must be given. Prune lightly in June and July, and cultivate through the growing season until August. Thereafter will be time for the wood to ripen. The peach should be planted in spring-time; remove all limbs, and head back main stem to about three feet in height.

E. P. DEIHL: It is not safe to cultivate after July 1st. The growth does not sufficiently harden after August 1st, if cultivation is kept up till then, to safely pass the winter.

DR. G. BOHRER: Pruning is most successful when done between December 1st and the 10th of March. Prefer rubbing off the sprouts at their first appearance, in places where not wanted.

WM. MCCRACKEN: Plant the seed. Allow the trees to fruit, and from them select the finest varieties for your orchards. Hale's Early has been a profitable variety, but many of our seedling productions have been more so. The cultivation is very simple. Plow the land as for corn, turning the furrow to the trees. They grow better and live longer. I do not prune the peach.

J. B. SCHLICHTER: Amsden's June is the only budded variety I have been able to fruit. Our seedlings bear well.

J. M. MILLER: The peach in Lyon county is small and insipid, unless the trees are pruned.

DISCUSSION—BLACKBERRY.

H. E. VAN DEMAN: Snyder is hardy, very productive, flavor insipid, about half the size of the Kittatinny. The Kittatinny is the best of all.

[NOTE.—Rust of the leaf was complained of by several, and the remedy generally recommended was, to remove the affected plants and burn them.—SECRETARY.]

WM. MCCRACKEN: Prefer the Lawton. Raspberries—The native varieties under cultivation are preferable to any other in my locality. Juneberry succeeds, and is profitable.

J. M. SHEPPERD, Abilene: The Juneberry is found wild in Lincoln county. Red Dutch currant succeeds with me.

Adjourned.

EVENING SESSION.

Tuesday, June 1, 1880.

Meeting was called to order by the President. Prayer offered by Rev. D. M. Moore, of Hutchinson; followed by music.

ADDRESS OF WELCOME.

Addresses of welcome were delivered by the Mayor, J. M. McCullough, and by L. Houk, President of the Reno County Horticultural Society.

RESPONSE.

The following response was made by M. B. Neuman, of Wyandotte:

Ladies and Gentlemen of Hutchinson and Reno County: The greetings of welcome which you have this evening extended to us, through the Mayor of your city, and the president of your county horticultural society, are especially gratifying to the members of the State Horticultural Society, from the fact that we feel the fullest assurance of your words of welcome being as sincere as they are complimentary. It is too often the fact that reception addresses are largely made up of unfelt expressions — mere flattering phrases, supposed to be appropriate to the occasions calling them forth. But there is an old adage that "*actions speak louder than words.*" And when we look around us here at the beautiful floral decorations which so tastefully ornament this sacred edifice in which we are permitted to hold our present session — and when we further consider the generous hospitality with which we have been provided for in your public houses and your homes — and, finally, when we see here present so many of the faces of your citizens, beaming with interest in our proceedings, we cannot for a moment doubt that your words of welcome are the true exponents of the real feelings of your hearts.

Here, then, we may appropriately refer to the work of the association which has given rise to this interest on your part. It is now about fourteen years since a few earnest fruit growers in Kansas, feeling the need of associated thought and action, and of the embodiment of individual experiences in the various matters of horticultural interest in our State, formed a union, which was the nucleus of a State Horticultural Society. In a few years, the value of the transactions of this Society became so manifest, and the demand for their wide dissemination became so general, that the Legislature of the State found it necessary to make appropriations for that purpose. Since then each annual publication of the transactions of the Society has increased the interest in, and the demand for them; and a rivalry has grown up between the different localities of the State, to secure, at the respective points, the holding of our annual and semi-annual meetings. And, further, it has been largely due to the guidance, and under the auspices of this Society, that the fame of our Kansas fruits has been so widely spread over our whole country.

All this I can appropriately say in regard to the Kansas State Horticultural Society, without incurring any charge of self-laudation, from the fact that my connection with this Society has been of too brief duration to entitle me to any of the honors it has so worthily acquired. But although a mere raw recruit, I am proud to have become an associate member of such an honored society; and on its behalf I am now most happy in responding for them to your address of welcome.

Ladies and gentlemen of Reno county, we thank you for your kind reception, and we hope that our discussions here may afford some partial recompense for your evidently sincere hospitality.

The following essay was then read:

ROADSIDE FRUIT-TREE CULTURE.

BY DR. G. BOHRER, OF RAYMOND.

Mr. President, Ladies and Gentlemen: Eighteen months ago, by request, I called attention before this Society to the horticultural resources of this State, and among other parts of the subject, I made mention of the cultivation of trees along section lines, as wind-breaks, but did not dwell at length upon the particular kind of tree culture to which I invite your attention at this time: I allude to roadside fruit-tree culture. And whilst we are on this expedition of investigation, I hope to receive not only a candid and impartial hearing, but in the event that the views I may be able to present seem reasonable and practicable, I hope they may be, by many present, reduced to practice and result in profit, and that no one will depart feeling that he has listened to simply the idle phantom of a dream.

The reason why I am more than ordinarily anxious to have all consider this subject candidly, will be very perceptible when we come to consider the fact that up to the present date, this method of cultivating fruit has received next to no attention upon this continent, and consequently is not understood by a large majority of our American-born citizens; while such of our foreign-born people as do understand it, have up to the present time been contented with doing when in Rome as Romans do — thus laying aside and ignoring those early lessons of neatness, economy and usefulness which they were taught by their ancestors, and have adopted instead, our neglectful, extravagant and lazy American methods of doing almost everything about the farm and fruit garden.

But why call attention to this matter here in Kansas at this period of American history, in presence of the fact that civilization has spread from the Atlantic ocean to the Pacific, and from the lakes of the North to the Gulf of Mexico, and has been attended with such a degree of prosperity as is unprecedented in the history of any country? — all, too, without having been accompanied by the cultivation of fruit trees and vines along our public highways.

In searching for a good and sufficient plea of justification in the premises, we need only to bear in mind the fact that until within a brief period of time there has been no real demand for such a system of cultivation. Land has been abundant in proportion to the tillers, beyond measure, and in most if not all of our Eastern States the condition of the country has not been such as to demand it, as either a means of protection to crops of any kind, or a source of economy and consequent income. In Kansas we have an undulating surface, or, in other words, nearly a level country, for the most part, and almost destitute of timber; and that timber is a great protection to field crops, is a question which I think requires no argument, as it is, I believe, almost universally admitted that such is the case. Aside from this, it is a well known fact that we have in some portions of the State a considerable amount of very fertile, and at the same time, very sandy soil, which neither a warranty deed nor a money-lender's mortgage will hold. In the absence of a border of timber of some description or other around farms made up of this kind of soil, they will in a brief period of time prove to be not only unprofitable, but positively worthless. The experience of the last ten years among farmers has settled beyond a doubt all controversy as regards the propriety of furnishing wind-breaks for the protection of crops upon any variety of soil in the level portions of this State.

Then, with the known facts before us, that we have a soil whose surface is undulating, or nearly level in a large portion of the State, and that it is destitute for the most part of timber, and that the same is a protection to not only the different crops cultivated, but to the soil in some localities also, the question naturally arises as to what kind of timber to cultivate that will best meet these emergencies. At the same time, it will be proper to make some inquiry as to what kind of trees will yield us the greatest amount of profit, aside from the protection they are to afford. In the investigation of this part of the subject, let us bring to our aid the experience of our German neighbors, whose habits of industry, economy and ingenuity are not questioned or in any way doubted, and consequently should be regarded as good authority in the case. From them we learn that the cherry is much used in most of the German States as a roadside tree. It is also much used in Switzerland for this purpose. The pear and plum are used in many cases, but are not so common as the former. I am told by many Germans that these trees are planted on either side of the public highways, and that in traveling for several days in succession, persons are constantly passing through an avenue of cherry trees. They are planted at the request of the respective governments for the purpose of protecting the soil, the crops, the stock, and for shelter and shade to the traveler. Besides this they furnish an abundance of fine fruit, of which the traveling public are permitted to partake, upon condition that the trees are not to be injured. In case it is the desire of the owner upon whose land the trees are growing to reserve the fruit of any particular tree, it is only necessary to tie upon one of the branches in a conspicuous place, a bunch of straw, a piece of paper or a rag, and it is respected. The fruits of these roadside trees, it is stated, are quite a source of income to the people, they being put upon the market in large quantities. By adding to this a large share that is consumed at home by the owners, and we will be pretty safe in concluding that this system of fruit culture is quite profitable, saying nothing about the benefits derived from the trees as a means of protection.

Formerly it was the custom in Germany to plant forest trees along the roadside, which proved to be beneficial in some respects, but positively injurious in others. For whilst they made good wind-breaks and afforded an abundance of shade for the traveling public, they, owing to their great height, also shaded the growing crops far out into the fields, thereby injuring them. And aside from this, they were frequently blown down by high winds, falling either into a growing crop or into the highway, in some instances destroying the life of the traveler, or that of his team, or both, and in every case of falling they proved injurious in some way or other. So that, through necessity, their culture as roadside trees was abandoned and fruit trees substituted, which afford equally as good a shade to the traveler and are of very much less injury of crops, are not so often uprooted by storms, and in instances where they are blown down they do not prove to be so destructive to the lives of either man or beast or to vegetation, and are less troublesome obstructions in either the field or the highway; besides, forest trees bear no crop of value, while fruit trees do.

Thus it will be seen, that fruit trees along the highway are in every way preferable to forest trees when once grown; and as the growing qualities of different trees are at this time entitled to a share of our attention, let us for a moment take them into consideration, and ascertain, if possible, what there is of merit about the tenacity to life of the forest tree, as a rule, that is without merit in the fruit tree. It is claimed by some, that fruit trees are not so apt to grow along the highway as the forest tree; others maintain that the reverse is true; and a third party take the position that neither the one nor the other will grow, if proper attention is not given them. With this party I most heartily agree, and will add, that according to what I have observed, the cherry, the apple, the pear and the plum will all grow along the roadside with a reasonable amount of care; but in the absence of this, neither these fruit trees nor forest trees will grow. Any of them will live if half let alone, but the fruit trees, in particular, will not make stately trees, nor produce good fruit. Forest trees, in order to become fully developed, require to be grown in groups, as we find them in their native state. By this means they afford each other protection. Fruit trees are somewhat different. If fruit is the object sought in their culture, each tree requires isolation to some extent; but extreme isolation has not usually proved to be beneficial, but rather injurious to the crop. But what would be the situation of either fruit or forest trees, planted in rows on either side of our roads in Kansas, where the law makes the highways sixty feet wide? In answer to this question, I will state, that if one man only in a school district should plant a row of apple trees on one side of one road, half a mile long, and the trees twenty-five feet apart in the row, each tree would be somewhat destitute of company and that protection which each one should receive from his neighbor. But if each farmer in a school district, township or county were to plant a row of fruit trees on each side of each road, and the trees fifteen feet in the row, if cherry, and twenty-five feet if they were apple trees, the situation would be far different. Each tree would afford its neighbor protection, and the country at large would be benefited by such a wind-break, and with a reasonable amount of care, all would be fruitful, and consequently profitable. Forest trees, similarly situated, would also prosper, but, for reasons already assigned, would not benefit either the crops or the people as much as fruit trees.

I have seen proper to call attention to these facts, for the reason that up to the present time, in Kansas, nothing in the shape of roadside trees as wind-breaks have been cultivated but forest trees, and they in limited numbers at that — the cottonwood, the box elder and the soft maple being almost the only trees planted. Now, why is this the case, in presence of the facts already pointed out? It is well known that, in the absence of some sort of cultivation, none of the above named trees will prosper. It is also well known, that the amount of culture necessary to insure prosperity in the growth of these trees will also develop the cherry tree. None of the former, when planted as wind-breaks, can possibly be really profitable in any other respect, while the fruit of the latter will be a source of income and profit. Besides, I feel well convinced that the apple will prove, not only profitable as a wind-break, but for its fruit also, if planted along the roadside. Just what the plum will do I am unable to state definitely. It is claimed that the curculio destroys the fruit of most varieties. The Wild Goose plum, it is claimed, does not suffer from the ravages of these pests, but as to the correctness of this claim I am not able to testify, and consequently shall not recommend it as a roadside tree until it has stood a series of tests. The pear, in Kansas, I am told, has not proved to be as successful, up to the present, as could be desired; consequently, I cannot recommend it very highly until it has proved itself worthy of extensive culture. But the cherry and the apple I have no hesitancy in recommending to the full confidence of the farmer as hardy trees in Kansas. The cherry, in particular, will not fail to give satisfaction, as our dry, sandy soil is peculiarly adapted to its growth and durability, and our latitude is most certainly adapted to the development of the fruit.

As to the kind to plant as roadside trees, I would give preference to the Early Richmond, and common black Morello seedlings. They are rapid growers, good bearers, and their tops are dense, whereby they are splendidly adapted to the use of wind-breaks. They require but little pruning, in fact are better off with but little. The seeds of a single tree, in one season, will produce sufficient young trees to reach around an entire quarter-section of land. Two days' labor with one team and hand will prepare the soil and plant the trees one rod apart all around such a farm. One hand with two horses and a double cultivator, will plow them three times in less than a day and a half. And three plowings in one season is about all they will require, and is more than most orchards get. After the trees are three or four years old they will require but little, if any plowing. Hundreds of thousands grow to maturity without any cultivation whatever, except to occasionally enjoy the luxury of having the weeds cut down about them. This same cultivation will be all-sufficient for any of the other kinds of trees named.

But I would not have it understood that nothing but fruit trees should be planted and cultivated as road-side trees. For there are some situations and kinds of soil in our State, not well adapted to their culture. And in these localities I would say, plant such trees as are most likely to succeed, avoiding as much as possible the cottonwood, which in my opinion is likely to prove a source of annoyance in the State of Kansas in less than fifty years. Its seed is already being scattered and beginning to grow in many fields intended for the cultivation of farm products exclusively. And when they come to be sown by the winds in large quantities, nothing but vigilance will keep them in subjection.

I am somewhat partial to the box elder for a wind-break, in localities along our public highways, where fruit trees are not likely to prove a success. This tree is hardy, and to some extent of dwarf habit. Its seeds, however, like those of the cottonwood, will be sown by the winds, but are not so annoying, as they are not so light, and consequently will not be carried so far. But we have some localities in which the land is low and damp. There the gray or fencing willow will succeed better, perhaps, than anything else; yet such localities, I am happy to state, are few, and not extensive in any one locality. Thus, all but a mere fraction along our public highways is susceptible to fruit culture.

There never will be a better time to begin its culture than now, and there will never be a time when such a system of fruit-tree culture will be of greater benefit. We stand in great need, not only of the wind-breaks, but of the fruit also. But I find one great obstacle in the way of such a system, which is, the difficulty in getting the trees. In order to overcome this trouble, nothing but a little vigilance is necessary. Just before cherries get ripe next season, write to some friend in the East to ship you two or three pounds of cherry seeds as they are taken out of the cherries, without drying in the least. Direct them to be packed in a little moist earth. On their arrival, have your ground prepared, and plant them without delay, one or two inches deep, in drills. Let the rows be three feet apart. The next season cultivate them well, and late in the fall take them all up and heel them in, out of the way of rabbits. In the spring following, plant them where they are to remain, and cultivate as already mentioned. In the fall, make an application of sulphur and soap, to keep off rabbits. Two more seasons' cultivation will end the principal part of your trouble, except to pick each season an immense amount of cherries. If it is the desire to plant apple trees instead of cherries, send to some reliable nursery and get root grafts. Plant them out, cultivate well for four seasons, keeping off the rabbits, and this trouble is also about over, except to prune them, just as they should be in regular orchards.

I have already stated that our public highways are sixty feet wide. Set the trees seven feet out into the road, which, if there be a row on each side, will leave the avenue about forty-six feet in width, which is all the space required, provided the road is kept in good repair, which the law should make special and rigid provisions for. Besides, trees when so planted should be protected by stringent statutory law; and I hope the attention of our coming Legislature will be called to this subject, and that it may receive such action as the case actually demands. The present law cuts off from each quarter-section of land of about four acres, making as heretofore stated, the public highway sixty feet wide, which is not demanded; and the sooner some such regulations are made as will induce land-owners to cultivate a portion of this sixty-foot strip, the better. I am candid when I state that in my opinion the State cannot possibly make any better or wiser disposition of the land set aside for public roads, than to offer every possible and consistent inducement to have a border on either side cultivated in fruit trees.

What step could the State take (to say nothing of the protection that such a system of tree culture will afford her as an agricultural country, or of the profit that will grow out of the same through the annual production of hundreds of thousands of bushels of fruit), that would add so much to her beauty and to her already more than ordinary natural attraction? Think of two hundred avenues of fruit trees, in full bloom, beginning at the Missouri State line and stretching four hundred miles, without any interruption, to the border of Colorado, or four hundred from Nebraska to the Indian Territory! Then think again of such avenues a little later in the season, loaded from one end to the other with delicious fruit. Would it or would it not be ornamental? And would or would not our people be both proud and happy in a home so situated?

Let us be candid and sincere in the consideration of this subject. And let me ask if what I have just stated is really practicable, or is it simply a stretch of the imagination, a strain of thought, which it is not possible for our people to reduce to a reality? In case there is any suspicion of this character, let us quote authority upon this subject from Europe.

Mr. Downing, an able and distinguished American horticultural writer, uses the following language: "We wish we could induce the planting of avenues of this and other fine growing trees in our country neighborhoods, as is the beautiful custom in Germany, affording ornament, and a grateful shade and refreshment to the traveler at the same moment." Then he goes on to say: "Mr. Loudon, in his arboretum, gives the following account of the cherry avenues in Germany, which we now gladly lay before our readers. The following is his language: 'In Moravia the road from Brunn to Olmutz passes through such an avenue, extending upwards of sixty miles in length;

and in the autumn of 1828 we traveled for several days through almost one continuous avenue of cherry trees.' Every one knows that these trees grow in American soil generally quite as well as they do in German soil. This being the case, why should they not grow quite as well along our roadsides, with an equal amount of cultivation, as they do along the German roads?"

The conclusion is irresistible and wholly unavoidable, that we can succeed quite as well, and from the foregoing facts pointed out, it is likewise conclusive that we ought not to neglect, but should with all possible speed, act in harmony with the example which they have set before us. Every financial interest of the State demands it, as the same would be benefited thereby. Aside from this, the comfort which it would add by checking our at present unbroken and fierce winds, is scarcely to be comprehended. Every observer of Western customs must be familiar with the practice of planting a grove about the house, as a source of comfort. Why not likewise plant them all around the farm for a similar purpose? Now, understand this is saying nothing about the actual protection which they would afford our crops by way of breaking the force of our hot southwest winds, which are so destructive to them, nor the effect it would have by way of checking the force of our north winds and causing an even distribution of snow over our winter crops of wheat, rye and barley, which now for the most part lie uncovered and exposed almost the entire winter, whilst the snow is blown into sloughs, deep gulches, behind houses, barns, straw stacks, etc., where it proves a nuisance instead of being a source of profit. Suppose, during the spring just past, that our section lines running east and west, north and south, over the entire State of Kansas, had been provided with a row of cherry or apple trees, or in such localities as were not adapted to the growth of fruit trees, box elder or fencing willow had been substituted, or any other timber of dwarf habit; and let us also suppose that each half-section line had been similarly situated: can any one for a moment doubt that great benefit would have been derived from the same by way of checking the fierce winds which were so prevalent?—which caused a more than ordinary speedy evaporation of moisture from our soil, especially in central and western Kansas, to the injury of crop and trees. Aside from this, how much more comfort there would have been in living in the country, during the month of April in particular. It will be remembered that wind was the principal subject of conversation, and goggles were more in demand among outdoor laborers than any other one article of trade. In fact, no outfit of agricultural implements could be regarded as complete without at least one pair of them.

But to consider our subject proper from a more candid standpoint: what inducements or influences can we bring to bear that will induce our people to plant fruit trees along our public highways? The mere fact that they will prove beneficial as wind-breaks, and profitable for their fruit, has not, up to the present time, induced the people of Kansas to look after this interest to any considerable extent. In my opinion, a very large majority of our citizens have not and do not yet realize the fact that such protection is indispensable to the success of both agriculture and horticulture. Of the truth of this position, we must convince them by discussing the subject through the columns of our agricultural, horticultural and floricultural journals, through our daily and weekly newspapers; and by all means let us not slight this subject at our county and State horticultural meetings. In the event that this will not be sufficient, let us bring to our aid, legislation. I would be perfectly willing for our next Legislature to enact a law requiring every real-estate owner in the State to put out at least one row of fruit or forest trees along each section and half-section line; if forest trees, to be of dwarf habit, for reasons already assigned. I would require these wind-breaks to be planted inside of the next three years, and be in good growing condition. Their future cultivation and protection I would also guard by rigid law; for it is not sufficient to simply plant or half-plant trees (as is usual now), and then leave them to shift for themselves, as regards cultivation. Such neglect is no better nor is it any worse than that man's conduct who planted his crop of potatoes and then left them to do do their own cultivating, and when digging-time came around, a neighbor asked him how they were yielding, replied that he supposed they would yield splendidly. "If not, it is not my fault, for I never did anything to them." I have often thought that it was a pity that trees could not kick, bite and scratch to the extent of producing temporary blindness, and dislocation of joints, in all cases where persons maltreat in planting, cultivating, or protecting them. I would by law impose a fine upon the person who wantonly injures a tree or destroys it, of not less than ten dollars nor more than one hundred dollars—half of the fine to go to the prosecuting witness, which latter provision would insure such statutory law to be more universally respected.

But just here quite a number of persons tell us that such rigid law is not only uncalled for, but that it would be an absurdity; for, say this class of persons, fruit cannot be raised in Kansas; and some have gone so far as to publish statements of this character to the world, as a means of discouraging their friends and everybody else from seeking homes in the State. Now, I undertake to say, that such statements have not even a shadow of real foundation in truth; and in making this sweeping declaration, I wish it most distinctly understood, that it is through no motive of a selfish character that I am prompted to do so. I have not a tree, shrub or flower for sale; in short, the only interest I seek to advance is that of our entire State in her agricultural and horticultural departments of industry. But further, with regard to these persons who claim to know so much about the bad qualities of Kansas, and who have invariably been guilty of doing so little to make her better than she naturally is, permit me to say, that their loud statements rest upon either shameful ignorance and dilatory habits, or upon untruthfulness. One party has gone so far as to write a letter for Eastern publication and perusal, in which he says, that the fruit which took the first prize at our Centennial

Exposition, and was reported to have been produced in Kansas, was selected from orchards in Eastern States. If this assertion be true, we had a shrewd set of rogues at the head of our part of the Centennial, for it requires no ordinary thief to hunt up and get away with the finest fruit in the world. This party further states, that our peaches are very small and sunburnt — which statement I do not doubt, in case he has reference to the peaches produced upon his farm, provided he has a farm. As a horticulturist, he is either an air-castle fruit grower, a paper-collar fruit raiser, or else he has an unquenchable thirst for living with his "wife's folks back East," and wishes everybody else to be as he is. If he has a farm, it is not bordered with fruit trees, or any other kind of wind-breaks, nor is it properly cultivated; but, on the contrary, it is most likely to be found in a badly-disfigured, lacerated and mutilated condition. I will here state, that I have never met the party to whom I refer, but I have met with quite a number who use language similar to his, and I have invariably found their farms and orchards to be in the condition I have guessed his to be in. I have also usually found these farmers to be experts in the use of the fish-hook and the shot-gun.

But, says another, out here in central Kansas we do not have sufficient rainfall to develop either thrifty trees or good fruit. Now, to my certain knowledge, this is a mistake as far as the trees are concerned, for I have over five hundred apple trees, about as many peach, and nearly two hundred cherry trees, all growing — equaling the growth of any of these varieties of trees in either of the great fruit-producing States of Ohio. Michigan, or Indiana; and as regards the fruit, I have no fears as to a lack of moisture, when we furnish such wind-breaks as I have recommended. Besides, I know of no region of country in the temperate zone, where good average Indian corn is produced, that would fail to develop the apple, pear, peach, or the plum.

Again, I am fully aware that it is claimed by many that in central Kansas roadside tree culture for the protection of the fruit and field crops would prove a fruitless effort, on account, it is maintained, of not only a lack of rainfall, but that our altitude is too great. In reply to this argument of altitude, I will state that observation has convinced me that any altitude that will admit of the development of thrifty trees and good corn, will also develop fruit of first-class quality. As to the question of rainfall, I have but little to say, further than to state that I have no confidence in the theories of any of our Kansas rain prophets, believing that we have no more and no less rainfall now than we had two thousand years ago. If I could be induced to believe that rainfall was on the increase in Kansas, I would leave the State; for I should feel confident that in time to come it would relapse into its so-called former desert condition. I do not believe that this country ever was a desert on accout of a lack of rainfall; but it was once densely populated with buffalo, elk, antelope and deer, who ate the grass off close to the ground and kept it packed hard. This, with an undulating surface such as our country affords, would cause a rapid drainage of the water that fell, and leave the general surface of the country comparatively dry. To-day it is different: these animals have disappeared. Hundreds of thousands of acres have been plowed again and again, through which means millions upon millions of gallons of water are retained and never escape, except through the medium of evaporation, thereby adding largely to our atmospheric moisture, and adapting it better from time to time to the growth of vegetation. There is no speculation about this theory, nor is there one particle of "paper collar" about it. This state of affairs has been brought about by a vigorous use of muscle and a free flow of perspiration. Let us have more of it. Let us plant, cultivate and protect fruit trees along our public highways, our section and half-section lines, around our orchards, our kitchen gardens and our residences, which will render much slower the process of evaporation; and in a brief period of time the beneficial results to be derived from the same will be plainly visible in the shape of beautiful fields of crops and delicious fruits.

Adjourned.

MORNING SESSION.

Wednesday, June 2, 1880.

At the appointed time, the Society assembled, and Rev. J. B. Schlichter, of Sterling, opened the exercises with prayer.

On motion, the subject of Dr. G. Bohrer's essay, viz., "Roadside Fruit-Tree Culture," was called up for discussion.

J. W. Byram, Cedar Point: Neglect would be the rule with roadside tree planting.

Wm. McCracken: If the trees were given to the people, they would not plant them. Many cannot be induced to plant trees upon their farms. If the people could be schooled to plant trees by the roadside, I will donate cherry trees to plant miles. Catalpa is an ornamental tree, and excellent for such purposes.

H. E. Van Deman: I favor the idea of roadside tree planting. In Europe, where all the land is occupied, this practice has been adopted. We should use such classes as are stately in their habits and long-lived, as the black walnut, ash, honey locust and catalpa.

J. W. Robson: The suggestions of the essay are a hundred years in advance of the present age.

DISCUSSION—FOREST-TREE CULTURE.

J. M. Miller, Emporia: By an examination of the experimental grounds of the Atchison, Topeka & Santa Fe Railroad Company, on the western borders of this State, it is found that the black walnut, honey locust, catalpa and Osage orange have grown finely, and are in a vigorous condition, but two-thirds of all the trees planted west of Larned are dead.

S. F. TAFT: Black walnut is of slow growth, but valuable; cottonwood is a fast grower, but of poor quality for its wood. We must grow wind-breaks before we can succeed with fruit-bearing trees. Do not go to the peddlers; their prices will bankrupt any one. Gather seeds from our forests, which are the best varieties to use, plant them and grow your own trees, and you will soon have a forest at a mere nominal expense.

MR. CUTTER: Black walnut is the most valuable of all forest trees to plant. Black cherry is desirable. Wet lands must be planted with cottonwood and the willow.

WM. MCCRACKEN: The drifting from plowed land can be prevented by planting rows of willow and Osage orange in the form of belts, across the fields. Should be so arranged as not to exceed forty rods distance from each other.

PRESIDENT GALE: The idea that has been crowded forward, that the simple breaking and stirring-up of the surface of the land will produce a radical climatic change, is an erroneous one, but in conjunction with tree planting a favorable result may be reached. A wind-break one foot high will afford protection to an eleven-foot space to the leeward, and in same ratio as the protection is raised. Wind-breaks should be located on the highest comparative section of the farm, to be of the greatest utility.

GEORGE Y. JOHNSON: A quarter-section of land properly protected with wind-breaks will produce a heavier crop than a whole section without such protection. Be very careful in arranging the bells to avoid encouraging what is called "draws" or "sucks" in the currents.

Adjourned.

AFTERNOON SESSION.

WEDNESDAY, June 2, 1880.

President Gale called the Society to order, and announced the following essay:

THE APPLE.

BY G. Y. JOHNSON, LAWRENCE.

The origin of this word is traced to Celtic, Welch, Armoric and Cornish words, all of which are traceable to the Celtic word meaning *ball*, a round body, and signifying fruit in general having a round form. This originally needed a qualifying term to designate the kind; yet in later days it is used so generally and applied so universally to the fruit classed in botany as *Pyrus malus*, that it needs at this day no qualifying term to render intelligible what fruit we mean when we say *apple*.

In tracing its early history, we are convinced that the introduction of the word into the Bible is due entirely to the translators, and most commentators agree that the word is used in the general sense referred to, or else refers to some sub-tropical fruit, such as the citron or orange. It is generally conceded, though not absolutely certain, that the origin of our cultivated apples was in Europe, particularly in the southern part, and perhaps also in western Asia. The original stock yet grows in parts of Europe, to the length of three or four feet, with a diameter of two to three inches, and bears fruit about the size of a pea. This shows something of the benefits of cultivation, and what may be accomplished by care and culture, as we now have apples weighing as heavy as 34¼ ounces, instead of one-quarter of an ounce, as the original weighs; or, should we choose to say they were created large, luscious and fine, it demonstrates how neglect will deteriorate useful things.

The belief that our wild crab is the ancestor of our large, fine, juicy Yellow Bellflower, or King of Tompkins County, is entirely false. I would like to be able to prove that the wild crab apple is the parent of the Missouri Pippin, but in missing the praise as in the first instance, it also escapes the disgrace of so characterless an offspring as the last instance. Though the wild crab has some variations, as I have myself seen them round, like a ball, flat, like a grindstone, or shaped like a Bartlett pear, yet they all adhere tenaciously to their wild nature, and are *crab apples*, despite all our efforts at improvement by cultivation.

Apples seem to have been esteemed an important and valuable food by the ancients, as Virgil wrote:

> "New cheese and chestnuts are our country fare,
> With mellow apples for your welcome cheer."

And about the commencement of the Christian era, Pliny wrote of twenty-nine varieties. In A. D. 973, historians inform us that King Edgar, of England, rested himself under a wild apple tree, from which we might infer that it is also a native of the British isles, or was introduced there in very early ages to at this time be called a *wild apple.*

The apple was introduced into the American continent soon after its discovery, by European immigrants, and seed seems to have been disseminated by those pioneers most thoroughly, for wherever they went they appear to have carried with them and planted in open spaces in the woods; and to this day through the woodlands of the early Colonies they are found in secluded places, in a half-wild state, sometimes bearing valuable fruit. It was in one of these secluded places that Col. Baldwin, whilst surveying an Eastern canal, found the fruit that to-day bears his name. Dr. Warder calls this quondam planter "Johnny Appleseed"—the link between civilization and barbarism—allied in many respects to both, and equally shunned by either, yet doing a noble work in preparing the way for civilization, and leaving for it a heritage of fine fruits throughout the wilderness.

The Siberian crab is also a distinct species, susceptible of much variation, yet retaining the same general characteristics; and we have them running through all the grades of flavor, from exceedingly sweet to exceedingly sour.

The culture of the apple seems to have made but little progress until within the past century. In the year 1597, an English writer on the subject of "The History of Plants," mentions but seven kinds of "pippins;" and I would say just here, that the word pippin is in signification similar to the word apple, only not as generally applied. It is derived from two French words, meaning "seed pulp;" and while it might be applied with equal correctness to the quince, or pear, or any other fruit having a pip seed surrounded by a pulp, yet by common consent it is only applied to the apple (or *Pyrus malus*). Hence, when one of your "variety-wise know-alls" takes up a specimen, and after giving one or two knowing squints and blinks, closely inspects the blossom end, and minutely examines the stem end, holds the fruit away to take in the form, artistically looks at the dots, stripes and splashes, and ponderously pronounces his verdict, "I think that is a pippin," you might, with much pertinence—though he might think it great impertinence—say, "Why, yes, you fool!—any *boy* would recognize that as an *apple*."

The early French settlers were great tree planters, and we can trace their footsteps from the St. Lawrence on the north to the Gulf of Mexico on the south, by the venerable apple and gigantic pear trees. One of these majestic pear trees was until recently standing near Vincennes, Indiana, being between 75 and 100 feet in height, and 125 feet across the branches, and yielded an annual crop of from 75 to 125 bushels of delicious pears. The names of these men deserve to be emblazoned upon the bright roll of philanthropists and benefactors of humanity. God bless them! and may their souls rest in peace, safe beyond the confines of purgatory, for they erected to themselves far better monuments than brass or marble, which will wreathe their names in eternal verdure.

As I said before, the propagation and multiplication of varieties do not seem to have received much attention as a profession until within the present century. In the *Ohio Cultivator* of no more ancient date than August, 1846, we find an authentic list of the varieties then in cultivation, which contains but twenty-two varieties, and many of *these* have disappeared, until now we seldom see them named in nurserymen's catalogues. On my own grounds to-day I have not one of the varieties there named, and in several years' experience as a nurseryman I never even had in my nursery but eight of these varieties, and only knew of two more in cultivation. About the year 1850, apple growing as a lucrative business seemed to receive an impetus, and since that time, varieties have been multiplied, and gathered up and placed in nurseries, each having its own peculiar merits—some larger in size, some finer in quality, until, in 1867, when Dr. Warder published a work, (to which I am indebted for many of these facts,) in which he gives over 1,600 named varieties that have come under his own observation. Since that time, varieties have been brought into notice, until it is no longer safe to give the number in cultivation, for it would be a mere estimate, and might fall far short of the number, and yet subject the party giving it to a question of veracity or sanity. One man in Illinois, I am informed, has now over 2,600 varieties in cultivation, and it is said he now believes that it must be a very fastidious taste that cannot be suited in 2,000, and has decided that number is sufficient for an ordinary fruit orchard for family use! The last estimate I saw of named varieties was 8,000, named and distinct. The nearest and most recent estimate of our fruits bearing in Kansas was in the exhibit at the State fair at Topeka, September, 1872, when Kansas had 883 plates of apples, comprising 178 varieties; Missouri had 447 plates of apples, and claimed 211 varieties; 80 varieties were common to both lists; — making 309 varieties in this vast collection from both States. And although this collection was all that the energy of active committees and earnestness of enthusiastic fruit growers could make it, yet both combined could show but 309 varieties. Notwithstanding these facts, we have men in our State claiming to have over 600 varieties in bearing, but it remains as true now as it did 1800 years ago —"By their *fruits* ye shall know them."

So much for the history of the apple; and allow me to say, that it has necessarily been brief, and very many interesting items have been omitted which have come under my own observation or investigation — yet I have given enough to give you some idea of its past record, and will now turn to its present cultivation, which far more intimately concerns us.

On the treatment of the apple in the nursery I will touch lightly, as I wish now I had touched of the calling, which for the past few years has been productive of more interest to the money-loaner than profit to the producer; in fact, it has been more absorbing of interest and principal than productive of profit. Leaving this, I shall speak more particularly, first, of the management after grown in the nursery and ready for orchard planting. As the old cook book says, in telling how to make rabbit pie, "*First,* catch your rabbit." Very sensible advice for us Western people who have no French cooks! So, in setting an orchard, first—

SELECT YOUR SITE.

Select high rolling land, if you have it, facing the north — northeast preferred. Northeast is the best slope that can be found in Kansas; yet this matter of *slope* is not so essential as some imagine, but a steep descent to the southwest is to be avoided if possible. If you have not high, rolling land, select some site slightly elevated above adjacent land, in order to escape as much as possible the late spring frosts. The cold air being more dense and heavy than the warm, lies nearest the ground and pushes the warm air up, so that often an elevation of six or eight feet in spring, while the ground is yet cold from winter frosts, will make a difference of several degrees in temperature — thus often saving the fruit buds and giving you a crop of fruit when fruit buds on land a very little below would all be destroyed. In order to secure the best results you need an elevation above the surrounding plain, be the general altitude high or low, and to get the full benefit of the elevation, the orchard should be placed as near the declivity as possible. Of course these rules hold good through the ordinary altitude, and do not apply to those localities so high as to be in danger of summer frosts. Good situations can be found on almost every quarter-section of land in Kansas, which to a greater or less degree fill the foregoing requirements.

PREPARATION OF LAND.

If you propose to set in the spring, the land should be thoroughly plowed in the autumn previous from nine to twelve inches deep, and could a subsoil or mole-plow follow four or six inches deeper, breaking up the subsoil, it would far more than pay the cost. This should be cross-broken in the spring, but not necessarily so deeply. When you cannot plow to so great a depth it is best to plant on top of the land and bank up to the trees, and back-furrowing to the trees a few years will give them the depth of loose earth for the roots to grow in. Your land should be clean, thoroughly pulverized and level for planting.

LAYING OFF ROWS.

This is most accurately and speedily done by taking a ball of tarred twine, as the tarring will prevent wearing and stretching, and sew or tie red or white thread or twine to note the distance on the line that you wish to set your trees apart. Start down one side of your field, and stretch the line, sticking a stake at each string or thread mark; then measure across each end and stake the opposite side. You have then but to stretch your line from the stake on one side to the opposite stake and place a stake at each mark on the line, and so on, until the plat is laid off, and the stakes will range in every direction. This will give the rows equal distances apart, and the trees when set will be in squares. If you should wish the trees to be equally distant from each other so as to give each tree all the available room possible, you can do so by the following

RULE FOR QUINCUNX PLANTING.

Draw parallel furrows (or set stakes by line) parallel with one side of your field one-half the distance apart you wish your trees to stand; cross these furrows or lines at right angles with parallel lines or furrows thirteen-fifteenths the distance apart you wish your trees to stand. Plant in every other intersection, and alternate the rows.

Example: If you wish the trees to stand 20 feet apart, draw furrows across the field parallel 10 feet apart; cross these at right angles, thirteen-fifteenths of 20 feet — 17 feet and 4 inches. Plant at every other intersection. The furrows being 10 feet apart, makes a distance of 20 feet alternate rows; the other rows being 17 feet and 4 inches apart, the other side of the triangle, being 10 feet, makes a hypothenuse, or the distance to diagonal tree, 20 feet.

But after the land is all staked off, the next thing is to get the tree to stand just where your stake was. To aid in

SETTING YOUR TREES,

Take a straight, solid board 6 or 8 feet long, bore a hole near one side in the center (lengthwise), and cut out, so as to slip over the stake; next bore a hole near each end large enough to slip over small stakes, or pins; make these two stakes or pins 15 to 20 inches long, and so the board will slip off them; adjust this board so the tree stake is in the center slot, or hole, and then drive the pins into the ground, through the holes in the ends of the board; remove the board and dig the hole for the tree; replace the board and set the tree, placing it in the slot in the center; and it must be in the same place the stake was set.

SELECTION OF TREES.

Always select stocky, well-headed trees; let the limbs be equally distributed about the stem, and if too numerous, remove with a sharp knife; four limbs coming out at different sides within a space of six inches, is an abundance, and the planter leaving more will some day sweat and saw, and saw and sweat, and if he does not use profane language, much may be to his credit in the book of remembrance. Never select a fan-shaped tree, with limbs shooting upward almost parallel with the body, forming what is commonly termed "split forks." These will disappoint you in after years, while the tree, the limbs of which start out at almost right angles with the stem, will very seldom split, either from winds or weight of fruit.

THE SELECTION OF VARIETIES

For the ordinary farm orchard, better be left to the nurseryman, if he is intelligent, whether he be honest or not; for if you select the list, he will cheat you if he wishes to, if dishonest, but if thrown upon his honor, even if he is dishonest, will generally do the best he can for you; and here let me interpolate—as much as possibly lieth in your power, buy of home nurseries. As a rule, a nurseryman grows what is best adapted to his locality, or at least what is most called for, and he can grow one variety just as easily as another; being in the business, he is presumed to be as much better posted in his special business than the average farmer, as a physician is in his above the herb-tea dosing grandmother. If you have your list ready made out, he seldom has time when you go for your trees to tell you the advantages of others, and so, if honest, fills the bill as far as he can, though he may know it will not give satisfaction in bearing.

I had, when in the business, orders sent to me with chosen varieties, "substitution positively forbidden," and the individual wished a succession of fruit for home use through the year, and yet not a summer apple in the list. Also another order, with varieties chosen, and not a winter apple named; and yet they were "badly scared," and did this to prevent being cheated by a nurseryman.

I need scarcely add that when their attention was called to the facts in my advices of shipment, they wrote me a regular "sky-lifter," because, notwithstanding their positive orders to the contrary, I had not violated their orders, and substituted. Just here let me tell you an anecdote: Being thrown over for twelve hours, without a train, at your neighboring city, Newton, some years ago, I took a stroll about the town to see what was being done in the way of horticulture. Noticing some trees recently planted, and observing a man inside the inclosure, bearing on his face that unmistakable something that plainly says, "*I am a living, walking, portable cyclopedia,*" I entered into conversation with him and learned the varieties of fruits he was planting, and when I expressed a doubt as to his succeeding with some of the tender varieties of sweet cherries he named, was met with the dictum: "Oh, you can't tell a Pennsylvania Dutchman anything about trees." I replied, "Ish dot so? I was not aware that a Pennsylvania Dutchman knew anything but lager beer, saur kraut and nix-come-a-rous." He bounced himself a foot high, and exclaimed "By Shiminy, they knows how to fight!" He being a muscular man, and I a Quaker, I granted him the question and forgave him the enthusiasm.

Having secured your trees, a very important matter is to take them home properly, being careful not to expose the roots to the sun's rays, and to the action of the drying winds, either of which will destroy at least the fibrous roots, important organs to the tree, as feeders or mouths, and are located at the ends of these small rootlets, to draw from the earth nutriment for the tree. Before you start from the nursery, take a sharp knife and cut smoothly all the mangled roots, then dip the roots into puddles made by thoroughly mixing soil and water, to about the consistency of thick cream, and repeat this process just before planting. Immediately on arriving home, heel them in, being careful to get fine dirt among the roots, leaving no holes for air to get in or water to stand. If the land has been properly prepared, you will simply have to clear out enough loose soil to make a cavity large enough to admit the tree without bending the roots in planting, and deep enough, to stand about one inch deeper than when in the nursery.

In autumn, bank up about six inches higher than surrounding land, so that the soil will remain dry around them, and during winter thaws to prevent the winds to blow the trees back and forth, creating a cavity about the trunk, to collect and hold water, so as to damage the bark by freezing. While the trees are young, and until old enough to put on rough bark, wrap the stocks in winter with corn stalks, to prevent rabbits from gnawing.

But before we leave the subject of planting, I would desire to say, when you get the hole about two-thirds filled with loose soil, shake the tree slightly, up and down, so as to thoroughly mix fine soil with the roots, then after throwing in a little more soil, tramp it down firmly, leaning the tree to an angle of 15° from perpendicular, and towards the southwest. Finish filling up the hole, and your tree is set.

It is best, always, to put the tree with the heaviest limb toward the southwest.

The corn-stalks should be removed in early spring.

On the subject of

PRUNING,

I would say, always keep with you a good pocket knife and a pocket whetstone. Never attack a tree with a dull knife. In passing about, through the orchard, when you see a limb that needs to be removed, sharpen your knife and be "instant in season." On this much-disputed question of pruning or *non*-pruning, the middle or mean doctrine is the safest. I have seen a *few* orchards ruined by pruning, and a great many that have gone to ruin from lack of pruning. Four words comprise all the science of pruning: *outward, upward, sunlight, air.* There is but little time when pruning is positively forbidden, and that is when the tree is frozen.

CROPS AMONG TREES.

Potatoes or pumpkins are preferable, but corn is not objectionable if not planted nearer than four feet, and thoroughly cultivated until the first of July and then let alone, for you must not keep your trees growing until caught by a freeze. Never sow small grain in an orchard; it absorbs the moisture, binds the soil, and trees do not do well. I sowed a crop of buckwheat in a portion of my orchard one year, and lost fully one year's growth of my trees, and there is a difference apparent to this day.

I have seen men sow to grass, and pasture an orchard of small trees; When men can plant corn, and sow the land to grass, and pasture it, and raise thereon a good crop of corn, they perhaps can succeed in rearing a young orchard in the same manner. When your trees get large, it may be a different question, but even then, great care must be exercised in the selection of variety of grass and the kind of stock to forage it. Clover, I think, is our best grass for orchards, and hogs the best stock to pasture it with.

As this is a rambling discourse, I will touch lightly a very heavy subject, *i. e.*,

INSECT ENEMIES.

These form so large a class that nothing short of a special treatise on the subject will give you much idea of its magnitude. We have enough of these and to spare already, and more coming. When the trees are large, if you will allow hogs the free run of the orchard, they form the best defense against many of the enemies that prey upon the fruit; and chickens will assist in destroying others. Among those they will materially assist in thinning out, I would name the codling moth. The crow blackbird, if allowed to nest freely in the orchard, will assist you to take care of the tent caterpillar. But the round-headed or crown borer will elude the vigilance of everything except cold steel in the hands of a vigilant orchardist, and you must go for him with your knife and wire. You can pursue the study of insects fully by studying the report of our able Chairman on Entomology, published in the annual reports of the Kansas State Horticultural Society; and I will only add, "Eternal vigilance is the price of Kansas fruit."

As I am talking to those mostly who are raising fruit for their own use, I will leave the subject of marketing to take care of itself, and will only say a few words on

KEEPING APPLES.

A good dry cellar, well ventilated and kept just above the freezing temperature, is best and will give the most satisfactory results, as at this temperature, with a dry surface, it is almost impossible for an apple to decay. A large family of children would also be a grand preventive from apples rotting. They (the apples, not the children) should be kept in boxes or shelves, not over six to ten inches deep, and entirely away from vegetables, such as potatoes, turnips, parsnips, etc., for an apple will take a taint almost as soon as will butter or milk.

SELECTION OF VARIETIES.

I have said a word before upon this subject, and would only add that every location seems to be a "law unto itself." There are some varieties that generally succeed. These you can obtain from the "Voted Fruit List," found in our published proceedings, to which every member is entitled.

If you are certain of the correctness of the variety, try what you like best, to a *limited* extent, even if it does not stand recommended in the list. Rhode Island Greenings are very profitable in a few localities, even if they are condemned for general cultivation. Yours may be just the locality it needs, but try it *easy;* don't rush into it extensively. So with other varieties not generally recommended that you may be fond of.

I have now spoken of the preparation of the soil, the laying-off the plat, selection of your trees, planting them, and what to plant or sow among them, how to prune and how to keep your apples, but have not given you any instruction as to the finale—that is, *eating apples.* I have heard a remark about the wisdom of a man who would try to teach ducks to swim. You will please excuse me—I guess I "won't."

I have thus hastily passed over a subject, endeavoring to give its outlines, that to be properly and fully handled and discussed, would take ten thousand such pages as these, and a much larger stock of patience than I give my audience credit for possessing. It takes years of patient study, labor and investigation to master a profession, and when any man tells me he is master of the nursery or fruit business, I know I am talking to a liar or a fool, or both combined; (if safe, tell him so.) Yet, by observation, inquiry and good "horse sense," a man can, with a reasonable amount of "elbow grease," well applied and persistently rubbed in, be reasonably assured of fair success; and the more one studies and investigates, the greater beauty he sees in plant life, and the better qualified he is to grow successfully an orchard of fruit trees. I know of no business, patiently and persistently followed, that will yield any better return and be a source of as constant enjoyment as the culture of fruit; and without making a pun, our *subject,* "The *Apple,*" is our *king* of fruits.

It is said that "fruit is an emblem of hope," and is the only portion of our food nature has provided ready prepared for immediate use. Fruits are the flowers of commodities. Their culture indicates refinement, and their use as food tends to a healthy, refined temperament, both of body and mind. Therefore it is our duty to plant orchards, and when our children and children's children and the stranger shall rest beneath its shade and eat the fruit thereof, our names will be spoken with praise in these artificial groves—imitation of God's first temples, where man first bowed the knee and acknowledged the great Jehovah, in praise and thanksgiving. By thus planting, we may hasten that glorious day when all nations shall be at peace—the wolf shall dwell with the lamb, and the leopard lie down with the kid, the calf, and the young lion and the fatling together, and a little child shall lead them, the cow and bear shall feed together, and the lion eat straw like the ox. Then every man may sit under his own vine and fruit tree, with no one to molest or make him afraid, and he will no longer need to be stayed with flagons, to be comforted with apples.

COMMITTEE ON FRUIT DISPLAY.

The President appointed the following persons: J. W. Robson, Wm. Cutter, H. E. Van Deman.

COMMITTEE ON FINAL RESOLUTIONS.

The following were appointed as the above committee: F. Wellhouse, A. J. Pope, E. P. Deihl and S. F. Taft.

LETTER—MISS LILLIAN M. RIDGWAY.

By request, the following letter, relating to horticulture in our common schools, was read by J. Byram:

Cedar Point, Kas., May 31, 1880.

Members Kansas State Horticultural Society—Gentlemen: I owe you many thanks for the kindly interest displayed in assisting me to carry out my little scheme for teaching horticulture to children. I regret that I have no more encouraging report to submit. Owing to two principal causes—the unfavorable season, and the lack of opportunity for class instruction—the result of the experiment is very unsatisfactory.

I distributed the twelve volumes of reports among a class of intelligent, enthusiastic boys and girls, explaining as fully as possible the use and object of the books. I then procured of the U. S. Commissioner of Agriculture a variety of garden seeds. These I also distributed, making each child understand that the Government held him responsible for the success or failure in their culture. The Secretary of your Society, Mr. G. C. Brackett, sent us a package of plants, which I divided among the class, giving instructions with regard to transplanting and general culture.

The seed requiring early planting came up nicely, but were totally destroyed by the severe April winds and a late frost. Since that time very few seeds have germinated, the hot winds and parched soil preventing. The raspberries, gooseberries and cherries sent by Mr. Brackett are nearly all alive, saved by faithful care and watering. The welcome rains of the 24th and 25th inst. will probably insure the germination of the seeds remaining in the ground, and put new life and vigor into the feeble plants. I hope the remainder of the season will prove less discouraging to their childish efforts in gardening.

I had planned a little course of incidental instruction to be given informally, in house or garden, field or forest, and at such seasons as would favor objective teaching, but it being vacation, I could not get the children together for class purposes, so *that* part of the experiment remains untried. I feel confident, however, that under more auspicious circumstances, it would have been successful.

When I began to look around for a suitable course of instruction, I found the field from which I was to glean so very broad that I was puzzled to know where to commence. Horticulture seemed to me something like a ladder, one end resting on the earth — at each upward step the horizon grew larger; but go as high as you might, the top would still be beyond human reach, for it rested on the Infinite. The science is wondrously beautiful, but oh! so complex, involving as it does, a something of geology, chemistry, botany, entomology, mechanics, meteorology, and how much more I dare not think. From among all these, I selected subject-matter for twelve lesson-stories, choosing such as I knew from experience would easily interest children, and could be made of practical use to them. I have found that a child, when once awakened to the knowledge of the *wonderful* things around him, and the *wonderful* power his reason gives him over these things, will be prompted by natural curiosity to further any personal investigations. Each lesson-story was to be of such a character that the book of nature could furnish the illustration.

It is with much hesitation that I submit my lesson outlines for your criticism. I cannot but feel how imperfect they are:

LESSONS IN HORTICULTURE FOR THE CHILDREN.

(For the use of teachers or others who love the little ones, and appreciate the useful as well as the beautiful. Designed for work outside the school room.)

I. Story of plant life, or the miracle of changing a little earth, air, moisture, sunshine and a dry seed into a beautiful tree or flower.

II. Soils and locations, or where shall the rose bush and grape-vine grow?

III. Care of garden — plowing, planting, weeding, watering.

IV. Roots, or how plants eat and drink. Lessons in transplanting.

V. Diœcious plants — how they "mix." Illustrations from garden. Inferences with regard to planting.

VI. How to make new varieties of flowers and fruits.

VII. The boy or girl who produces a fine, mealy Kansas potato from the seed is a public benefactor.

VIII. Rainfall, or why we should plant forests.

IX. Raising apples and strawberries.

X. Seeds — when to gather them, and what to save.

XI. What insects shall we destroy? How they look, where they live, how to destroy them.

XII. What insects shall we protect? How they look, where they live.

I regret that I am not able to respond to the invitation of your Secretary, and write you a paper upon "Horticulture in Common Schools." My experience in the common-school work is too limited, and my acquaintance with the subject in question too slight, to warrant any such attempt.

It seems to me, however, that no State requires more intelligent gardening than does Kansas. Her motto is true. If we reach the *stars* in this respect, it will be through difficulties. If we would make labor more productive, we must make it more scientific. The law of cost and compensation is fixed — something is never given for nothing. We need skillful farmers, gardeners, and fruit growers; we want kingly minds instead of slavish hands to control the "plow and pruning-hook." Is the State doing *all* in her power to meet this demand? If in our primary and higher education we know what we wish to produce, it seems reasonable to suit the means to the ends. The only *real* knowledge in *any* direction is that which may be converted into *practical power*. The path leading to the future prosperity of our commonwealth is industrial education, where the practical underlies the intellectual. Massachusetts, with her crowded factories and crowded cities, requires industrial drawing, to assist her children in becoming independent, self-supporting men and women; but Kansas, with scarcely a buzz of machinery — what *practical* application does she make of her industrial drawing? Does it add to the capital or resources of the State? Will it draw a line over which the moths and beetles cannot pass? Will it give us fruit and vegetables for our tables, and make our sandy plains rejoice in copious showers and luxuriant forests?

Perhaps I am blind, presumptious; but it does seem to me that we have begun our industrial education at the wrong end. Drawing is a beautiful art, and in some localities an essential art; but in Kansas it can *never* take rank with horticulture as a productive occupation. Our industrial college is a noble institution — God speed it! — but that by itself can never make a practical education in horticulture possible to the masses. I trust that this important science will speedily command the attention of our wise and far-seeing educators, and be given a prominent place on our common-school programme.

I fear that I have wearied you with this long, desultory letter. With best wishes for a pleasant and profitable session, and the advancement of its cause,

I remain, most respectfully yours, LILIAN M. RIDGWAY.

An invitation from the Reno County Horticultural Society to visit the fruit farmers in the vicinity of Hutchinson, was accepted, and the meeting adjourned till evening session.

EVENING SESSION.

WEDNESDAY, June 2, 1880.

President Gale in the chair. The following proceedings occupied the evening.

Opening prayer by Rev. E. B. Tucker.

ENCOURAGEMENT TO HORTICULTURAL EFFORT.

BY M. B. NEUMAN, WYANDOTTE.

It is yet much less than a quarter of a century since earnest, wide-awake and systematic fruit culture commenced its career in Kansas, and yet, during that brief period we have succeeded in building up a horticultural name and fame of almost world-wide notoriety. But, notwithstanding the gratifying results thus early accomplished, we have not escaped serious discouragements. In fact, disappointed expectations have been so numerous and varied that many of our fruit growers are now wavering in their faith in Kansas as a fruit-growing State; hence the purpose of this paper is to arouse and refresh the hopes, and awaken fresh energies among the despondent portion of the Kansas horticulturists.

But let me premise that I do not propose herein to discuss any of the details of practical fruit culture, nor to suggest anything new on the subject of how to make the business more profitable. Whole volumes of such matter, better in shape, and better in the richest colorings of thought and practical experience than anything I am able to present, are annually laid before our Kansas fruit growers, in the published transactions of this Society, wherefore a mere bird's-eye view of horticultural progress in Kansas, and some of its attendant features and results, are all I shall here undertake to set forth.

At first we entered upon our horticultural labors strongly imbued with our Eastern educations and experiences, the only lights we then possessed, and undertook to adapt these to the then untested conditions of our new homes. Of course we were sadly disappointed in many of the results. Many of our old favorite varieties proved unsuited to our peculiar locality, some disappointing our expectations by yielding fruits of depreciated qualities, while others scarcely survived the first few crops of fruits produced. But accumulating Kansas experiences gradually exposed our many earlier errors, both as to modes of culture and proper varieties to plant. And now, after all our successes and failures have been carefully noted and critically considered by the intelligent members of this Society, selections of varieties of all the leading fruits adapted to our soil and climate have been so well made, and the proper modes of culture have been so well pointed out, that in all of our eastern counties we can safely adapt these selections and modes of culture, with the fullest reliance upon satisfactory and profitable results. Thus, after what has thus been so well accomplished for eastern Kansas, we can confidently hope that a very few more years of our labors will equally well accomplish for the central, and ultimately for all the western portion of our State; and thus the conditions of successful horticultural enterprise will become established, and the profitable features of fruit growing will be demonstrated in the proud and progressive young State of Kansas. And when the profits of the business become assured, there can be little doubt that it will have a sufficiently crowded following.

But there are inducements beside the mere matter of profit to engage in the culture of fruits. As a special illustration of this fact, I may here appropriately indulge in a brief glance at the peculiar enjoyments and attendant blessings of the family whose homestead is properly supplied with the varieties of fruits adapted to the respective seasons. And herein I will present the bill of fare for the feast of a single year, but which may be annually repeated from childhood's tender years as long as life may last.

Commencing in April, when the system is most affected by the relaxing effects of the change from winter's bracing atmosphere to the approach of summer's glowing heat, how gratefully does the flagging appetite welcome the refreshing tarts and sauces prepared from the rhubarb plant, which, although simply vegetable in the manner of its growth, partakes so much of the character of fruit in its culinary preparations, that it well deserves to be mentioned in this connection. And scarcely does the palate have time to tire of this new enjoyment, when, in rapid succession, are ushered in, strawberries, currants, the early cherries, and gooseberries, regaling the appetite with their varied delicious flavors until June is well advanced. Then, through the remaining days of June and during hot July, the later cherries and the raspberries, the apricots and early peaches, the summer apples and pears, the blackberries and the plums afford continuous and ever-varying delights to even the most fastidious tastes. Next, through August and September, in mingled harmony and contrasted sweetness, the continuing blackberries, and the later plums and peaches, grapes and nectarines, apples and pears, embracing the choicest varieties of each, fairly satiate the appetite in its efforts to fully enjoy such a superabundance of tempting delights And, lastly, through remaining fall are gathered in, for present and for winter use, the luscious, late autum pears, and the teeming supplies of golden and crimson pippins, which, with the jellies and preserves, and jams and marmalades, prepared from the entire preceding list of fruits, are to "chase dull cares away" through approaching winter's angriest storms, and to last until returning spring completes the circle, and opens afresh the tempting bill of fare with which our feast commenced. How, then, can a family fail to become loving, virtuous and happy, when withheld from the paths of simple temptations by home attractions such as these?

But next I must be permitted to present, as one of the crowning inducements to horticultural labor, its features as a means of intellectual and moral elevation. Without in the least degree underrating the dignity of any other calling of life, I may unqualifiedly assert that no human avocation calls into action any higher order of intellectual energies or conduces to more enlarged moral development than does intelligent horticulture. To the fruit grower who is educated in the elementary principles as well as in the art of his calling, each and all of his various practical operations are but the opening before his mind's eye of leaves from the book of nature, all of which are replete with themes for profitable reflections and elevating exercises of thought. Not a furrow is turned by his plow, not a handful of seed is sown, not a germ is revealed as it peeps above the surface of the soil, not an opening blossom nor a developing fruit is presented to his eyes, that does not carry with it studies of the deepest interest to himself and to his fellow-men. Then also, the constituent ingredients and characteristic properties of the varied classes of soils — the peculiar fertilizing agents and their modes of application requisite to the renovation of impoverished lands, and the conversion of barren wastes into fertile and fruitful orchards and gardens — the processes by which the almost countless varieties of vegetables and fruits are improved and brought up to higher grades of excellence — in short, all of the wonderful yet systematic processes by which the obedient forces and elements of nature, when yoked with intelligent purpose, are made to render their most efficient services in increasing the quantities and improving the qualities of all those products of horticultural labor demanded by the varied wants of man, afford ample scope for the most profound investigation and study At the same time these studies are so inseparably blended with the many convincing illustrations of the infinite wisdom of the Divine power and of the supreme regard of Deity for the welfare and happiness of the human family, that our hearts are necessarily affected with the deepest emotions of love, and our minds are inspired with the most profound veneration toward the Great Author of all these inestimable blessings.

Then, walking thus, as it were, side by side and hand in hand with nature, and in his high, semi-creative powers, with reverence be it said, in the immediate footprints of Deity itself, the horticulturist has but to make proper use of his great advantages, to elevate his moral and religious growth, as well as his intellectual character, to a standard not surpassable through the influences of any other calling of life. Nor is it the least of his peculiar advantages that the exercises of his vocation are concurrently affording the highest development to his physical organization — thus tending to constitute him, in all respects, the model of perfect manhood.

Nor should we lose sight of the important truth, that these beneficent means of intellectual, moral and religious growth — God's richest gifts to his creatures — cannot be ignored by man, without entailing upon himself and posterity all the imperfections which such neglect of the Divine purposes must inevitably occasion. Then, how unjust to himself, how unjust to his family, how unjust to society at large, and how unjust toward the Author of his being, is he who, having a farm, or even town lots, on which to plant, neglects to become, to the extent of his means, an *earnest and persistent fruit grower.*

In conclusion, Mr. President, I take a special pleasure in referring to the work already accomplished, and the greater work yet to be accomplished, by the devoted labors of this Society. For years I read its transactions with absorbing interest before becoming personally acquainted with its leading members. Since then that interest has been largely increased by the opportunities of meeting with you personally. True, erroneous ideas have occasionally found expression in these meetings, but ready and sharp criticism has generally nipped in the bud the effects of such indiscretions; and the sum of your transactions has unquestionably been one of the chief factors of the prosperity and wide-spread fame of our State. The value of these labors has not only been appreciated by the popular mind, but successive legislative appropriations in your behalf have shown that the representatives of the people of Kansas appreciate what is due to their constituents, in the aid they have so repeatedly granted to extend the publication of your deliberations. And this well-deserved encomium on your labors may be uttered with special appropriateness by one who, from the brief period of his association with you, cannot be charged with blowing a mere self-laudatory trumpet.

Then let our work continue to progress in the direction it has hitherto so successfully pursued, until we establish as a settled fact, what is already a matter of reasonable faith, that Kansas is to be one of the leading fruit-growing States of our National Union.

After reading the foregoing essay, Mr. Neuman proceeded, extemporaneously, as follows:

Ladies and gentlemen of Reno county, when, on my arrival here, I first learned the disheartening conditions of your horticultural prospects, I seriously hesitated as to the propriety of reading this essay at our meeting here. It seemed to me that the picture I have attempted to draw of the charms of a homestead properly supplied with fruits, might be considered here as a mere mockery of the sad discouragements that have hitherto attended the horticultural efforts in this locality; and to incur even the possibility of such a misconstruction of my purpose, I deemed to be a most ungracious return for the warm hospitality with which our Society has been received among you. But since, through your further kindness, I have had the opportunity this afternoon of taking an excursion to witness the practical results of agricultural and horticultural work in this vicinity, my mind has undergone a material change as to the possibilities of fruit culture in Reno county. An examination of the farm of Mr. George Cole, some four miles west of your city, illustrates so well the beneficial effects of *proper windbreaks*, that I have since felt a strong assurance that horticulture, as well as agriculture, is bound to become successful with you. Indeed, it is perfectly reasonable to assume that the all-wise God never created so beautiful a valley as this to remain forever a treeless and fruitless waste. True, it will cost time and labor to bring about the desired end; but it is coming—*it is coming*—and those of you who hold out faithful unto the end will most as-surely secure your satisfactory and exceeding great reward — even to the realization of all I have attempted to portray in my picture of a fruit-supplied homestead.

PRESIDENT GALE'S SEMI-ANNUAL ADDRESS.

Members of the State Horticultural Society, and Citizens of Hutchinson: It was a proud day for Rome when her noblest sons loved the peaceful and retired pursuits of the farm more than the exciting scenes of the forum. It was a glorious day for her when she could call men from the plow to direct the affairs of state. The stories of olden times teach us that the strength of a nation, while rising to the zenith of her glory, is in her rural population, and as long as that power reposes there, her course is onward and upward; but when that population become the abject servants of the few, the days of her glory are numbered. As we look abroad to-day over this vast land, with its teeming, working millions, we must feel that there is a power in this pushing, restless mass, destined to mould the conditions of life through long ages to come. When we watch the ceaseless westward flow of population, filling up all the valleys and rolling out upon the wide prairies, we are forced to realize that not only the center of population is moving westward, but the center of vital energy, of enterprise, of wealth and patriotism is moving westward also. The power that is to hold this Nation as in the grasp of a giant, dwells to-day in the Mississippi valley. The hope of the Nation is in the character of the mass of this people — not in the character of the crowded denizens of the city so much as in the character of its rural population. While it is the fashion to urge the population of the cities towards the country, it is a matter of some moment to know what educating influences will be brought to bear on these people. While hundreds of thousands are coming to our shores from the Old World, with the peculiar features and views of every nationality under the sun, we are forced to ask, what is to be the educating power that is to control this mass, and to shape it for the good of the Nation? With the Chinaman on the one side and the colored people on the other, and realizing all the evil tendencies of ignorance and barbarism, we are led to ask again, where are the educating influences that can save our Nation?

As we look into the future, our hope is in the rural population, and in the education that rural life bestows. The disturbing and distracting elements gather in festering masses in our cities; and while there have been in times past, and in all likelihood there will be in the future, bad men, churlish men, quarrelsome men in the country — men having the unhappy power of making everything uncomfortable about them — it is seldom that men of this class organize in rural districts to control the good. But in crowded cities, the corrupt, uneasy elements become dangerous. A rural people, then, is not so much to be feared. It is more stable, and a far safer repository of the rights of the people. We hope to find among the rural population, in the hearts of intelligent and earnest men, the safeguard of our liberties.

We are to remember that our security rests in the *educating power of the rural home.* As in the past, so it will be in the future. From these rural homes must go out the youth who are to take the places of honor and trust in the land.

In considering the educating power of rural life, it is worthy of note, that it imposes and establishes habits of industry. There is unquestionably something exacting in the ceaseless demands of farm life. Even in the more enticing and delightful pursuits of the garden and the orchard, there is a constant round of watchful work. It is only the novice who sees fruit fall into outstretched hands without exertion. It will do in poetry to sing of resting beneath our own vine and fig tree. There is a thrilling beauty in a bed of pansies, a sparkling glory in a clustered mass of verbenas, and a majestic grandeur in a garden of roses, but the history of all this concentrated loveliness is measured only by long ages of care and hard work. The same is true of every department of farm life. Look at the noble horse, and think for a moment what a history of care and intelligent forethought is implied in his splendid proportions. What long years of care and expensive attention are implied in the perfected ox, swine or sheep. There is an enchanting beauty in trees, and parks and lawns, but all tell of work—continuous, earnest work. We need not ask why men learn to work, where there is so much to do. It is the treadmill of life, and every man and woman must keep step. It will not do to fall behind. Hence, the force of circumstances makes men industrious. The call to work is imperative. There are only a few laggards. There are special and important advantages in this constant demand for work, especially in shaping the habits of the race. There is no other pursuit of men that, with as few detracting influences, gives such unlimited scope for the formation of habits of industry.

Rural life also seems to secure a healthful development of manhood. Rural life in this respect has almost unlimited advantages over other modes of life. There can be no hope for a nation only as based on a healthful physical, intellectual and moral manhood; and for the development of all that constitutes real manhood, there are no more effective helps than those secured by rural life. Its healthful and constantly varying forms of labor, almost exclusively in the open air, favor the full development of the physical nature. Its usual retirement from the temptations of the crowded city and its wide range of occupation, peculiar to each season of the year, and calling constantly into exercise the many distinct faculties of both the physical and mental man, at the same time opening new fields of thought and inquiry, must serve to quicken and educate.

It is a fact well established, that the developed manhood of the country is now and must remain for all time the hope of the city. It is the flow of youthful rural population to the cities that gives vitality and nerve to the great business centers. More need not be said. If it can be deeply impressed upon our minds that we need in every possible way to unify, broaden, deepen and strengthen the educational influences of rural life, an important end will be reached. Our part in this grand work should be fully recognized. If the moulding influence of rural life is to be accepted as an imimportant factor in the social problem, then the part that horticultural pursuits are to exert must not be overlooked. We should assume that we have a great work to do in deepening, strengthening and purifying rural impressions. We should take up to-day the full measure of this work, and carry it forward with all the love and faith of the Christian patriot. To this end, homes in fee simple for the mass of the rural population are imperatively demanded; and the next great work is to make these homes attractive—to strengthen home ties, and to make these homes the nurseries of a noble and pure manhood. To this end bring the family to a home which is to be THE home where the household gods are henceforth always to dwell, never again to be jostled by rude removal. Each succeeding year gives new ties and strengthens old ones. The home may be a very lowly one, but it is the family home. There is a pledge of protection in that conviction. On this conviction is really based the most splendid achievements of horticulture. Men will do for their own home what they will never think of doing for a transient dwelling-place. Our first aim is for a permanent home, where the household are to walk hand in hand for years together, where the children are to grow to manhood and womanhood, and where the parents are to go down through the years of the sere and yellow leaf lovingly leaning on each other. It is around such a home as this that horticulture will entwine its strongest ties, and festoon her loveliest flowers. It is here that she will become life's great educator. With an abiding faith in the power of surroundings to give bias to the human mind, I must regard the office-work of horticulture as most important in its effects upon national character and national happiness. Its office in the development of the whole man cannot be insignificant.

Horticulture must be recognized as taking a prominent part in the general arrangement and planning of the home. Its aim from the outset is to make that home a thing of beauty; that beauty can never be independent of the idea of comfort, convenience, and profit. Home must bring its returns in the interest of the family; it must be regarded as securing, directly or indirectly, all the necessities, and, as far as practicable, all the conveniences and luxuries of life. The real necessities of mere existence are very few; the savage finds them in the wigwam and the forest; the half-civilized man finds his wider range of wants answered in a rude cabin and its ruder surroundings. As man mounts higher in the scale of being, he gathers more of comfort and beauty around him; the fruits and vegetables of the garden attract his notice; they soon find their place in his home, and ere long are counted among the necessities of his life. Henceforth he is bound more firmly to his home. The work of his hands not only brings him some measure of comfort, but it awakens a desire for a better condition of things. Slowly but surely he learns that actual profit and beauty go together; he soon begins to collect about him things of beauty—trees, shrubs, and flowers. The love of the beautiful strengthens in his nature, and soon he finds a thousand ties binding him to the place he calls home. Man may for a time be satisfied with the fruits, vegetables and flowers that unassisted nature gives, but soon he reaches out for something better; and the same is true of his surroundings.

Now if Horticulture is to be an educator, she must show her power in making beautiful homes, not for the wealthy only, but for all the people. It should be her first object to teach the masses how easy it is to have convenient and comfortable homes, and then how easily real and abiding beauty can be added to this convenience. More thought and time should be given to the management of homes and their surroundings. The work of time in growth and development should be held steadily in view, everything being done with reference to what may be seen and enjoyed in years to come, as well as to immediate effects. While work is involved in rural home life, let our object be to convince the mass of the people that it comes within the power of every man owning ever so humble a home, to make its surroundings attractive, and even beautiful. It is more the want of attention than either time or means, that makes so many homes untidy and repulsive. It is not necessity that puts the heaps of old rubbish, old wagons, carts, dilapidated cultivators, drills, and even more valuable tools, to the front. It is not poverty that leaves the home for years bare and dreary, but criminal neglect. Let us seek, then, in some way to awaken a generous emulation in the horticultural ornamentation of such homes as the mass of the rural population must occupy. Let it be clearly taught by healthful example, that beauty does not dwell alone with wealth, and that a thousand attractions can almost without cost be gathered around the humblest homes. These attractions may be very simple in their character—as a shrub here, a tree there, or a few flowers, while the forbidding and the repulsive are carried to the background. Then, with the consequent culture of taste and the accumulation of wealth, will grow up a more ornate improvement. It may be easy for wealth to command the beautiful, but ours should be the aspiration to put that beauty into the hands of the masses, and to teach all men that Nature herself will really do the work if we only give her a helping hand.

It is a part of our duty to aid in banishing all rude uncouthness from rural life. The idea prevails in some minds, that rural occupations can only be associated with a rude and uncultured condition of life; and, unfortunately, there is often abundant occasion for this impression. It is your part to testify, by your own personal culture, that this need not be the result. Let it be shown that the special province of horticulture is to refine and elevate man, and to give him higher conceptions of what life is, and to make that life in its better features broader and deeper and purer, and to give him the grandest conceptions of what he may become, and what he may make of others, and of his relation to the future of the Nation and the world. We shall probably find no more impressive illustration of this thought than can be found in the immediate and prospective influence of forestry upon Kansas. We cannot contemplate the work already begun, without associating it with the grandest results in years to come. Forestry is fast assuming a national importance, and must ere long command the attention of the best minds. We must recognize the economic bearing of this question; but the claims of protection, climatic influence and ornamentation all bear on the future of this great work—a work, we believe, having more to do with the future of Kansas than any other ever attempted, But we should remember in our very first efforts at forest culture the simpler rules of landscape gardening, and not lose sight of the idea that beauty and economy may go hand in hand. I need not dwell on the influence of gardening, fruit and floriculture upon our national future. I can urge that the work of the horticulturist is designed to elevate and ennoble rural life. It is this feature of our work that gives it a national importance. Acknowledging the fact that the future of our Nation is in the hands of the rural population, and that their moulding is in a large degree committed to our hands, we must recognize the responsibility of our position.

Meeting as we do to-day in a region almost treeless, it is a matter of moment to consider what is the work demanded of us as a society, and what may may be the future of this beautiful region. Manifestly our work, with respect to all western Kansas for the present, lies largely in the direction of forestry and protection. To attempt to ignore or under-value this work, will be to strike at the vital interests of the State. We cannot afford to hazard the prospective interests of this great region by accepting the somewhat popular idea that forest culture is not a necessity on the Western plains. We anticipate a grand future for this State, but we are confident that her triumphs will be closely allied to the success of her forest interests. As the first step in advancing State and individual interests, and in securing permanent prosperity and happiness for our people, let us seek to inculcate by precept and example, ennobling ideas of the influence of rural life.

—It is fitting that as the presiding officer of this Society, I call your special attention to the great loss we have sustained in the removal, since our last meeting, of our esteemed friend and brother, DR. WM. M. HOWSLEY. Dr. Howsley had for many years been actively engaged in the cause of horticulture. He had been associated with our Society from the beginning. He gave much thought and time to the interests of horticulture in his adopted State, and was always a bold and fearless advocate of whatever he conceived to be right. He fulfilled the duties of his varied positions in connection with this Society with distinguished honor to himself and to the great satisfaction of a large circle of friends. We can only say, in addition to what has already been said in the volume of our transactions, now about to be placed in your hands, that in the departure of our honored brother our Society has lost one of its strongest friends, and the cause of horticulture one of its most able advocates.

Adjourned.

MORNING SESSION.

Thursday, June 3, 1880.

President E. Gale in the chair. Prayer was offered by Rev. E. B. Tucker.

REPORTS OF VISITING COMMITTEES.

H. E. Van Deman: Visited Mr. Switzer's farm, three and one-half miles south of town, and found it in a very good state of cultivation. A box elder wind-break on the south was very effective. The land within the influence of these trees was loose and mellow, but had not been affected by the wind, while just outside it had been blown into drifts. Turner raspberry we found badly winter-killed. Kittatinny blackberry had been pinched back with good results. Strawberries cultivated in the matted-row system, with mulching of straw. Gooseberries, Houghton's Seedling, in good condition. Pie-plant was mulched heavily. Mr. Switzer informed us that this was the most remunerative crop he raised, the stalks finding ready sale. The Mountain currant is very productive. Mr. Switzer is raising the Russian mulberry. The tips of the branches were killed by the spring frosts. This farm has been a very successful one—considering its age and the unfavorable season. Everything is kept in the highest state of cultivation.

At Mr. Webster's, we found trees and plants growing well, but his farm lacked the wind-break on the south, and had consequently suffered from winds.

Robert Milliken, Lyon county: Our committee visited the sand-hills north of the city. We found a variety of soil some distance from the city, of clay, containing alkali. Several ponds of water were encountered. On the foot and side of the hills, small plantations of trees had been made. Grain is backward. Wheat short and thin. Corn is a good stand. The flora is different from that of the eastern portion of the State.

Wm. Cutter, Davis county: In the ride so generously given us by the Reno County Horticultural Society, we started in a southeastern direction from Hutchinson, and made our first stop at the farm of Richard Pierce. We found his four-year-old apple trees in bad condition, the heads entirely too high, and nearly defoliated by the drifting sand. Peaches had suffered from the same cause. Cottonwoods were trimmed out of all reason, and the inevitable result, viz., sun-scald, completed the work of destruction. Box elder was doing well; the soil sandy.

Our next stop was at the farm of Mr. Gilliland. Here we found a better state of affairs. Four or five-year apple trees were in a healthy condition, with the exception of one tree. A Dominie, I think, was badly damaged by twig borers. The peach was in fair condition, but we discovered it was being damaged by the borer. Trees set within the last two years, topped lower, were more thrifty and promising.* The bodies were wrapped with long grass, an excellent practice where people trim too much, and is indispensable in the absence of wind-breaks. Blackberries, raspberries and grapes had been well cared for, but we are sorry to say the reward for their labor appears to be far in the future. A June rose on the north side of the house was blooming profusely. The cottonwood is doing very well, and from the evidence of good taste and energy among the farmers of this section we feel warranted in saying that wind-break will soon spring up, and success will crown their efforts.

From here we turned to the north and returned by another road, passing many houses and farms. Saw some hedges in fair condition, but badly covered with drifting sand. One box-elder hedge was thrifty, but too open. We saw upon every hand the death and destruction of trees and crops occasioned by those terrible sand storms, and returned, convinced that the great and only cause of failure is the absence of wind-breaks.

PRESIDENT GALE: We were taken westward. In the experimental grove of the A. T. & S. F. Railroad Company which we visited is enough evidence to convince any man that forest-tree culture may be made a success. Judge Houk's garden is well protected by trees on the south. The garden is in good condition. The native willow is proving better than the common gray willow; it will withstand dry weather and shifting sand; the drifting sand, without protection, is ruinous.

Were pleased with the success of Mr. Cole's field. He has a good hedge on the south, 5 or 6 feet high, with cottonwood trees inside 10 or 12 feet high, forming an almost perfect protection. The Dracut Amber grape here contains large and healthy bunches. Concord is an uneven crop. His protection on the north and east sides consists of a good hedge and one row of trees. Mr. Cole has kept his ground free of gophers, by keeping 20 or 30 cats on his farm. They require a little milk twice a day, but are a perfect protection from the gophers. The subsoil is a light, soft sand. I see no reason to become discouraged with such evidences of success wherever we went.

F. WELLHOUSE: I measured the growth of apple trees on Mr. Cole's farm. They have already made over a foot of growth, and are in a healthy condition. Evidently from the protection, evergreens are growing magnificently. The wheat crop is thin and light. Blackberries growing nicely. Gooseberries are full of fruit. Would be proud of such a plantation of trees in Leavenworth county. On all the farms visited, the evidence is clear that all that is needed to make this a successful country, is the judicious planting of trees.

PROF. ROBSON: Visited the farm of Mr. Ellsworth. His trees are suffering from sun-scald, through high pruning. The flat-headed borer has commenced his work. The vegetable garden looks well. Here is the best patch of pieplant west of Junction City. There is abundant evidence of the good results of mulching. The Russian mulberry makes a splendid wind-break, growing low and compact. We here found a neat hedge of Japan quince. Also, two green-houses, with stock in vigorous growing condition. It is evident that floriculture is not being neglected in the southwest.

MR. CUTTER: Went to the southeast. Visited the farm of Mr. Pierce. His four-year-old apple trees are trimmed too high, and are injured by the sand. Found cottonwoods injured by sun-scald, from being trimmed too high.

At Mr. Gill's, we found apple trees in healthy condition. Peach trees were in fair condition, but badly damaged by borers.

M. B. NEUMAN: There is a superabundance of sand here, and all the people require is to keep plenty of it in their gizzards.

DISCUSSION—VEGETABLE GARDENING.

ROBERT MILLIKEN, Emporia: The Planet seed drill is much used with us for sowing. Seed and top onions are both grown. Cabbage is sown in February, and set out in April. Henderson's Summer is now taking the place of Jersey Wakefield as an early cabbage. The short or oval radishes are taking the place of the longer varieties. There are no home-grown potatoes in market yet. The Early Ohio is preferred to the Early Rose; it is earlier by several days, and is a better potato; it is lighter colored and less flattened, or reniform. We are looking for a substitute for the Peachblow; Brownell's Beauty comes nearest to filling the bill. The sweet potato is extensively grown in our county. A canvas covering without oil is being used quite extensively for hot-beds; heavy netting, with paper pasted on both sides, is used; lath frames are used to regulate light and heat, and as a protection from the wind; twenty lath are used to each frame four feet square.

H. E. VAN DEMAN: The common mistake in hot-beds is, that they are made *too* hot; they are sometimes hot enough to cook beef; they should be made of unfermented horse manure, covered with five or six inches of earth; the seed should not be planted until the manure is well spent, in order to prevent over-heating; canvas covering is as good as glass; when oiled, the canvas seems to decay, and will last only one season. A good soil is one of the essentials for successful gardening; you must have wind-breaks here (Reno county); everything should be planted in rows; the system of "feather-bed" gardening is over a hundred years old. Cultivate the garden often.

WM. CUTTER: The Snowflake potato is preferred to the Peachblow; it is an earlier potato, but keeps well, and is just as good for spring use as fall. Mulching gives the best success. Early Vermont is considered the best early potato. We should not plow too deep for sweet potatoes; it is best to plow just before planting.

ROBERT MILLIKEN: With me, six out of every half-dozen Snowflake potatoes contain black specks; they have been discarded. One planter plows for sweet potatoes by throwing up two furrows for ridges. A variety of sweet potatoes called the Black Spanish is creating quite a sensation with us. The Red Bermuda for early, and the Yellow Nansemond for the general crop, are the favorite varieties.

H. E. VAN DEMAN: The Southern Queen is our favorite sweet potato. They grow very large, with only one or two potatoes in the hill. I cultivate with a two-horse plow, throwing a furrow away from the side of the ridge, and returning, throw it back. If sweet potatoes are kept dry and at an even temperature through the winter, they will not spoil. I have kept them in a barrel lined with paper and straw, or in dry dust collected from the roads, and generally allow them to dry one day in the sun before packing away.

J. M. SHEPPARD: I pack sweet potatoes in dry chaff, with excellent success.

F. WELLHOUSE: There is no way to keep sweet potatoes equal to a good dry cellar. In my vicinity there are two dozen cellars that sweet potatoes are kept in. They are now selling at seventy-five cents per bushel. I filled one of my cellars to the upper floor, and then filled up the doorway. On taking them out in the spring not one potato in one hundred had spoiled. [A voice: Do sweet potatoes bloom?] No; sweet potatoes never bloom here. Thought I had a bloom once, but it turned out to be a sunflower.

A. M. SWITZER: Dug a cellar 14x8 and 4 feet deep, covered it with scantling, and ventilated through the top, in which I kept sweet potatoes through the winter. I am satisfied that they can be kept successfully in dry cellars. Pack in shallow bins, and cover with dry sand.

F. WELLHOUSE: Dig sweet potatoes before any frost, from the 1st to the 20th of September. They will not keep if not dug before or immediately after frost. I have had the best success when they were taken from the ground to the cellar without drying. Dig them with a plow having a sharp rolling cutter, by running as near to the row as possible without injury. Then take off the cutter, and turn the ridges upside down. In preparing to plant, ridge by plowing three furrows together with the plow. Smooth the ridges with an instrument made by taking three elbows of 2x4 scantling joined at an angle of about 45°, and securing them about two feet apart by nailing strong boards from one to the other. A seat is then secured on top for the driver, and the instrument is drawn astride the ridges, making them even and smooth, besides breaking many clods. Men or boys can put out from seven to ten thousand plants in a day.

G. Y. JOHNSON: I plow for sweet potatoes in the fall, and ridge up by plowing in lands, without disturbing the under portion. Dig with a heavy plow having a rolling cutter.

By request of the Chairman of Committee on Arrangements, Mr. Cutter and Mr. Taft were added to that committee.

Adjourned.

AFTERNOON SESSION.

THURSDAY, June 3, 1880.

DISCUSSION—BIRDS IN THEIR RELATION TO HORTICULTURE.

J. W. ROBSON: The Lord never created anything in vain, and I believe the laborer is worthy of his hire. The crest-headed titmouse is harmless, and a friendly bird. He remains with us all the winter. I offered every inducement for him to remain in my orchard in Illinois. I threw some offal from the butcher into the limbs of my apple trees, and he remained all winter, pecking at the bait. I had no codling moth next year. The orchard oriole builds its circular nest about as high as one's head, in the forks of the branches. It is of a drab color; does not interfere with the fruit, though I would be willing to give him the best of my fruit. It may be known by its spiral movements in ascending the limb of a tree, searching for insects, occasionally giving voice to its *chee-ree, chee-ree.* The rain crow or American cuckoo is a useful bird. It eats every species of caterpillar having a hairy coat. It destroys the tent caterpillar. The jay has the same habit. The butcher bird is known from its habit of impaling insects, toads, mice, etc., on thorns or twigs. It destroys the canker worm. Robins are very useful in destroying subterraneous insects, as the white grub. It remained with me all last winter. The question of the quail came up at our last meeting at Holton. I have had quails breed in my vineyard, and never knew them to destroy a single berry. I should like to see a man kill a quail on my place. I have found fifty or sixty chinch bugs in their crop at one time. The chinch bug hibernates in the perfect state. The very days when the chinch bugs come out to sun themselves, the quail is busily engaged in its good work. The quail feeds largely on subterraneous insects. The thrush finds the principal part of its food beneath the ground. The crow blackbird is a friend to the farmer and horticulturist. I have the same feeling against the cow bunting that I have against every old bachelor and old maid in Kansas. They do not believe in domestic bliss, but lead wandering, aimless lives of idleness. The kingbird is very destructive to insects. From habit, it always chooses a perpendicular perch. It may always be seen on the highest fence-post or weed, keeping a sharp lookout for flying insects. I always put up tall poles here and there in my orchard, for the kingbird. The red-headed woodpecker is a friendly bird. I haven't a great many cherries, but the woodpecker may have his share.

L. J. TEMPLIN, Reno county: The birds have been increasing with us from year to year. I know the woodpecker is a friend to us. The quail is multiplying very rapidly. On my place, for the first year or two I saw but one pair; now they are quite plentiful. They are our friends. It will justify us to take care of the birds. The downy woodpecker is occasionally seen in the valley.

G. Y. **Johnson**: I am a friend of the quail. I like him—on toast. I don't believe that a well-trained quail could be induced to eat a chinch bug. I never could find a chinch bug in his crop, nor a semblance of one. But he does an immense amount of good, all the same. The crow blackbird I consider the greatest enemy to the tent caterpillar. The thrush eats grasshoppers freely. The Baltimore oriole is no friend of mine. [Robson: But he eats the curculio.] He must eat five bushels per day to pay for the grapes he eats. He seems to peck at the grapes for the same reason that a lady teacher of North Lawrence recorded for discharging a scholar—"for his pure cussedness." The American creeper, or so-called sap-sucker, is very useful. The Iceland lapwing is better than a hired hand to destroy insect pests. There is no bird except the Baltimore oriole but what earns its way. [A voice: What does the turtle dove live on?] He lives upon love. He is the laziest bird the Lord lets live. He constructs his nest by laying three sticks crossways, and there the eggs are laid. When I first began fruit growing, I would have sent back East for robins, had I not remembered the story of the Scotchman who sent back for the Canada thistle, and soon had an elephant on his hands. If you want birds, plant trees, and the birds will as surely come as morning comes after night.

J. W. **Robson**: The killdeer is the most destructive bird of the Rocky Mountain locust I know of. Encourage them. Protect them. Don't allow them to be killed. The English sparrow is a countryman of mine. There were immense flocks of them in the old country, sometimes darkening the sun. They never ate the grain. They are insectivorous. Prof. Cone says they are driving out all other birds. Not so. He is a pugnacious fellow, but fights with his own kind.

L. J. **Templin**: The scientific and practical men of the East are its enemies. We had better wait before bringing it into this valley, till it has been further tried.

J. W. **Robson**: The measuring-worms on the trees in the East did not disappear till after the importation of this bird took place. I hire a boy to do work on my farm, and he gives satisfaction. When pay-day comes, would it look well for me to take my shot-gun and order him to leave? Yet this is a parallel case.

J. M. **Miller**: What is the best book on ornithology? *Ans.:* The best elementary work is, "Our Own Birds," by Prof. Beard.

S. F. **Taft**: I have found chinch bugs in the crops of quails. I am convinced that the oriole will pick grapes.

L. J. Templin then presented an invitation from Winslow & Albright, druggists, Hutchinson, Kas., to visit their establishment for the purpose of seeing "the best private collection in the State," representing all the branches of natural history.

PACKING PLANTS FOR MAILING—A BRIEF OBJECT-LESSON.

BY H. E. VAN DEMAN.

The essential things for packing plants are common moss, a cotton rag, oil paper and strong wrapping-paper. The moss should be thoroughly moistened by dipping in water. It should not be soaking wet—about as dry as you can squeeze it with the hand.

The rag should be spread on the table and the moss scattered over it and sprinkled among the roots of the plant. Then wrap the whole in the rag, leaving the tips exposed. Oil paper is simply common wrapping-paper saturated with linseed oil. Lay your bunch on the oil paper, double one end over the butts, and wrap. Then wrap again in tough paper. The degree of moisture about the roots is an essential thing.

I would rather have the moss too dry than too wet. Plants packed in this way may be sent at one cent per ounce.

DISCUSSION—GRAPE CULTURE.

WM. MCCRACKEN: When planting, give plenty of room. I find it pays to plant ten or twelve feet from open trees like the catalpa, and train to them. There is no trouble in raising crops of grapes every year.

S. F. TAFT: Plant grapes 10x7 feet, and train on trellis, not more than six feet high. Train in the fan shape, with three branches. I have seen grapes trained for twenty years to a single stake. I don't see why we can't raise grapes in the Arkansas valley if we plant wind-breaks. Even without protection we raise a few bunches.

J. W. ROBSON: I simply rise to give my mode of pruning. I think it the best, in this windy country. I follow the system that nature has adopted with the raspberry and blackberry. In the fall of the first year cut back to one eye. Next year grow two canes, and cut back to one bud. The next is the first bearing year. Let each vine mature one bunch and grow three canes, from which select the two best and cut the third to one bud. Put down a stake each side, and eighteen inches from the vine. There will this year be a considerable amount of grapes on the laterals. Pinch back the growing branches to one bud from the bunch. Grow four new canes. This year put in higher stakes, a little further away, with one in the center for growing the young canes. The surface of the ground should be protected from the scorching sun. By consulting the book of nature, we find that she mulches. The ground on the hillside exposed to the sun becomes exceedingly hot, and it don't take long to injure the roots. Let the Concord be your standard.

L. A. WALKER: Our knowledge of horticulture should be gleaned from what we read, from what we hear, and from nature. I plant eight feet each way. To keep the vines within bounds, we must prune. I selected the Concord, and am satisfied that I made no mistake. The grape was intended for the manufacture of wine. I shall have too many grapes for the demand. I would not advise any one who does not intend to make wine to go largely into grapes; it won't do. But I would advise every one to plant out fifty or sixty for home use. You may try other varieties, but you will at last fall back on the surest, the Concord. Mulch well, and stir it in. My grapes are very well fruited, entirely escaped the frost, and we have no rose chafer.

H. E. VAN DEMAN: I have had experience in all methods of training, from the stylish French to the let-alone system; I plant 8 feet by 10 or 12, and train in the fan system; I use a trellis of two wires, the first two feet high, the second four feet. When pruning, spread out the vines about one foot apart on the trellis. If you mulch once, you must keep it up; mulching brings the roots near the surface, and if removed, is certain death.

WM. CUTTER: Grapes will pay without any care; I had a row trained in what the strawberry culturists would call the "matted-row system;" they grew in tangled bunches, like a row of muskrat houses. One fall I saved some grapes on this row for the fair, but on going to gather them, I found the quails had eaten them all. Next year they disappeared in the same manner. I set a trap, and caught—*a coon!*

THE PRESIDENT: Mr. Cole, of this place, is making an expensive experiment with thirty or forty varieties of grapes; they are not yet bearing, but the results will be of great value. I should like to ask Mr. Robson why he advocates the cane system, in preference to the spur system.

J. W. ROBSON: I grow grapes for good, luscious fruit, and not for the wood, and pinch back to develop the buds. This system has the advantage of throwing the sap into the bunches, and not into the leafless wood. By horizontal training, the bunches are kept near the ground, beneath the influence of the wind.

DISCUSSION—IRRIGATION.

G. Y. JOHNSON: I beg leave to present the following communication from Martin Allen, of Hays City. Mr. Allen's article was called out by a plan proposed by some of our papers for increasing the rainfall by damming up the ravines, upon the theory that where water is, water will go, for the same reason that people go to Saratoga—because others go there:

EDITOR STAR: As you seem to invite criticism on the editorial in your last issue in relation to increasing our rainfall, allow me to say that your theory, if I understand it—"that it takes water to create rain"—is a true one, and that your plan of catching and retaining, by means of large dams on our principal streams, while good as far as it goes, I fear would be found impracticable from the immense expense attached to the undertaking, in the present financial condition of this portion of Kansas. True it is, that two-thirds of the earth's surface is water and one-third land, and that where the most water is there appears to be the *most* rainfall.

The waters caught and locked up by well-plowed fields, by snows and frosts of winter, snow caught on the mountain range as well as that held by ponds and lakes, should all be counted in making up the supply on hand; and our buffalo wallows that are distributed all over these broad plains, when full, hold vastly more water than the few and expensive dams you suggest. When these buffalo wallows are full, we have a humid and growing atmosphere, and would not need anything better. Whatever tends to preven a rapid flow of water out of the country, or superinduce moisture or humidity of its atmosphere, will help to lengthen out our season of rainfall, and dams of course would be directly in this line; but I think a well-plowed field would absorb and hold in check as much water as a dam one-tenth of its area. Then, tree planting is another important element in modifying climate and drouth; for while the shade from the sun of a line of east and west trees extends no great distance, their influence upon the winds (which is a powerful factor with us in promoting evaporation) on a level surface, is supposed to extend eleven times the sum of their height.

I think dams along our principal streams only, and at a distance of four or five miles apart, would prove inadequate to produce the results you claim, besides being a heavy expense. On this question, let me suggest what I deem a better and much less expensive plan: In working our roads, on every section line, where they ought to be, to make a slight fill where every depression occurs, say from one to four feet, according to the nature of the ground, and provide for drainage above that when necessary; this would create dams of less or greater dimensions wherever a ravine or depression, ever so slight, is crossed by the road. They would be numerous, and would appear on every section line in the county. Two such dams already appear on Fort street, in this city, and held a supply of water most all of last summer; another appears just southeast of my house, from a slight fill made in working the road, the water of which, being backed up on plowed ground, made most of its show in the increased growth of the trees there planted.

The great problem of dam building — to retain moisture, I apprehend — is in using a little discretion in the working of our common roads. But like the old saying, that "All signs fail in a dry time," so all these appliances must fail in a time like the present. The water seems to be in other latitudes. All the region west of the Mississippi, to the crest of the Rocky Mountains, seems to be dry, and without a supply of moisture to fill our plowed fields, buffalo wallows, or even small dams, to say nothing of the larger and expensive ones you suggest, because the rivers and streams, even where you would locate them, are themselves dry.

I have no doubt but that in ordinary dry seasons, when the trouble is from want of a proper distribution of rainfall, more than from an insufficient amount, that the appliances we have noted, with others of less consequence, will so modify and equalize the humidity of our atmosphere, as to make our country one of the most productive and desirable to live in. But in a dry year, such as the present promises to be, when the whole country is dry — at least the whole eastern slope of the Rocky Mountains (which seems to recur once in twenty years) — then it is that the chief hope seems to be, like that of the ancient Jews, in giving our land a year of rest, having provided for our necessities from the abundance of the past.

L. J. TEMPLIN: Irrigation may do for a garden, but upon a quarter-section of land it is impracticable. The Gulf of Mexico is sending up plenty of water over this country. During our spring drouth, it was passing over in plenty. What we want is, to condense it. During the spring, the air was nearly all the time just below the point of saturation. It will be necessary to increase the local evaporation in order to add to the moisture already in the air. The culture of forest trees will add to the evaporation, and bring the air up to the point of saturation. Wind-breaks will bring rain.

J. M. MILLER: Is gardening practicable by artificial watering?

ALEX. BROWN: In California, I have seen potatoes grown without a drop of water from the clouds. They sold for five cents per bushel, and were as good as I ever saw.

F. Wellhouse: I conclude that well or river water is lacking in carbonic acid, ammonia, etc., that the rainwater washes from the air. It does not have the effect on plants that rain will have. The earth absorbs these rich gases, and water taken from the river or well is nearly devoid of them.

REPORT OF COMMITTEE ON FRUITS AND FLOWERS.

The Committee on Fruits and Flowers presented the following report:

Your committee having examined the exhibits on the stands and tables, report as follows: The fruit branches are heavily laden with their respective fruits, giving evidence that the fruit prospects are good in the various localities from which they come.

EXHIBITORS.

C. Bishir, Hutchinson: Native currants, Morello cherries, black raspberries, Houghton gooseberries, Kittatinny blackberries, Sand Hill plums, Concord grapes, white willow tree, two years old, measuring twelve feet high and two and one-half inches at base.

G. C. Brackett, Lawrence: Six boxes of strawberries—Wilson, Charles Downing, Crescent Seedling, Capt. Jack, Austin, Cumberland, Triumph.

Wm. Cutter, Junction City: Apples, pears, cherry, plum and peach.

A. M. Switzer, Hutchinson: Currants, gooseberries, raspberries, blackberries, and of strawberries, the French Seedling and Col. Cheney.

A. S. Dimock, Hutchinson: Jar of Late Crawford peaches.

C. H. Longstreth, Hutchinson: Specimen of wood-growth.

Alex. Brown, Reno county: Strawberries—The Sharpless, Glendale, Capt. Jack, and Col. Cheney.

H. E. Van Deman, Geneva: Apples, peaches, nectarines, blackberries, gooseberries, dwarf juneberry, and specimen of catalpa wood.

Specimens of pot plants were exhibited by the following parties:

Mrs. Dr. Sidlinger, Hutchinson: Vinca, Irish Joy.

Mrs. Hale, Hutchinson: Calla, Begonia, Vinca, Day Lily.

Mrs. W. R. Brown: Calla, Geranium.

Mrs. B. J. Potter: Flower stand, containing Leopard Plant, Chinese Primrose.

Messrs. Winslow and Albright: Two varieties Oleander, (white and pink).

Mrs. John Brown: Pink Geranium, Tea Rose, Oleander.

Mrs. E. Wilcox: Geranium.

Mrs. M. Mead: Geraniums.

Mrs. Empey: Geraniums.

Mrs. Nash: Geraniums.

Mrs. C Longstreth: Canna, Euonymons, Agave.

Mrs. W. Lewis: Flower stand, with German Ivy, Dew Plant.

Mrs. L. Houk: Material for floral decoration—cut flowers.

Mrs. J. E. Bonebrake, Abilene: Collection of cut greenhouse flowers—Roses, ornamental shrubs, Hardy Climbers, Hardy Ferns, and Mosses.

Mrs. Dr. McKee: Bouquet of roses, and a flower stand.

Mrs. A. M. Switzer: Collection of roses, honeysuckles, and specimen of tamarix.

Messrs. Winslow and Albright: Collection of preserved insects.

These floral exhibits give evidence that the interest in floriculture is yearly increasing. Respectfully submitted.

J. W. ROBSON,
H. E. VAN DEMAN,
WM. CUTTER,
Committee.

Adjourned.

EVENING SESSION.

THURSDAY, June 3, 1880.

Prayer by Rev. D. M. Moore. Music by the choir.

DISCUSSION—FLORICULTURE.

J. W. ROBSON: In our Society meetings, a great many of our papers and our talks have been about decorating the outside of our homes. I wish to speak of the history of floriculture. There are many of us here who remember when the flower garden contained little more than cabbage roses and "old man;" and day lilies, oleander and some of the cactus family were about all the plants known in the window garden. I remember the time when there was not a green-house in the city of Chicago. Now, millions and tens of millions are invested in floriculture. The first green-house in Chicago was just the ripple from New York. It rapidly grew into a mighty wave, which has swept westward over Kansas and surged over the peaks of the Rocky Mountains. I am speaking more particularly to the ladies. I never saw a lady that did not love flowers. To have a good window garden, you must begin now. Plant cuttings and slips. Pots exposed to the air dry out too rapidly. To prevent this, plunge them into saw-dust.

L. J. TEMPLIN: We have no saw-dust here.

J. W. ROBSON: Then substitute sand; it is just as good. Re-pot when the rootlets appear at the bottom. The growing plants must be vigorously pinched back, and not allowed to bloom. We cannot have flowers in summer and winter from the same plants. You will want more than three geraniums and roses. Try begonia fuchioides and the winter-blooming carnations. If well grown, you will not be without carnations the whole winter. Fuchsias will not succeed unless we can shade. The red spider is its greatest enemy. The best remedy against it is, to wash the plant well with soap-suds. Do not try the parti-colored double petunia. The double white is sweet-scented, and flowers all winter. I cannot close without recommending bridal wreath; deutzia gracilis, with its beautiful sprays; eglantine, or sweet brier, and the shield and deer ferns. Sweet alyssum, from seed sown in August, will fill the whole house with perfume. Candytuft must be grown in a pot, to be seen in all its beauty. Sow pansy seed in August, and you will have smiling faces looking at you all the winter. We ought to grow flowers in the house, during winter, for the sake of their influence on husband and wife. They say there is a skeleton in every house. But flowers will take the skeleton off the nail and throw it out of doors. The mission of flowers stands next to the mission of Christ. I came to Hutchinson expecting to see a wilderness. Forgive me. The flowers I have seen make me feel young again.

G. Y. JOHNSON: In beautifying homes, avoid everything loud. Don't put everything in front of the house. Plant outskirts of large trees if you can, small if you must. Strewing the yard with wagons, plows, etc., is not ornamentation. I never knew a *lady* who did not love flowers. I have known females who did not love them. I do not advise the planting of the costly greenhouse plants commonly sold. There are kinds of plants you can succeed with. You can raise zinnias and balsams, callirhoe, phlox or prairie sweet william. Well-water may be made as good as rain by throwing into it some live wood coals. A great advantage is gained by pulverizing charcoal and mixing with the soil. Iron scales from the blacksmith's will greatly deepen the color of foliage and flowers.

FINAL RESOLUTIONS.

The Committee on Final Resolutions then offered the following report:

Your Committee on Final Resolutions respectfully submit the following resolutions:

Resolved, That we hereby tender to the Reno County Horticultural Society, and the citizens of Hutchinson and vicinity, grateful returns for their generous and kind treatment so freely rendered to the members of this Society during the meeting; that we heartily express our thanks to L. J. Templin, the esteemed Secretary of said county society, for his special efforts to make the meeting a success; and to those who enlivened the exercises of the session with appropriate music, we tender special thanks.

Resolved, That we acknowledge our obligations to the members of the M. E. church for their kindness in granting the Society the free use of their building.

Resolved, That we fully acknowledge the renewed obligation under which this Society is placed to the Union Pacific, Atchison, Topeka & Santa Fé and M. K. & T. railways, for special favors extended to our members in attendance at this meeting, and to each we hereby express our hearty thanks.

Resolved, That the Secretary be requested to furnish authentic copies of these resolutions to the several newspapers of Hutchinson, for publication, and to the officers of the several railway companies herein mentioned.

E. P. DEIHL,
F. WELLHOUSE,
S. F. TAFT,
Committee.

On motion, the Society then adjourned *sine die.*

PROCEEDINGS

OF THE

FOURTEENTH ANNUAL MEETING,

HELD AT WYANDOTTE, KANSAS,

TUESDAY, WEDNESDAY AND THURSDAY, DEC. 14, 15 AND 16, 1880.

In response to call of the President, the Society assembled at the city of Wyandotte, Wyandotte county, Tuesday, December 14, 1880, and opened its fourteenth annual meeting at 10 o'clock A. M., in the Congregational church, with President E. Gale in the chair.

Hon. C. W. Murtfeldt, of St. Louis, Mo., lead the exercises in prayer.

Col. N. J. Colman, President of the Missouri State Horticultural Society, being present, was invited to a seat with the President.

C. W. Murtfeldt made the announcement that the Illinois State Horticultural Society was holding its annual meeting at Warsaw, and moved that a congratulatory telegram be forwarded to that Society, which was concurred in. The following is a copy:

[Telegram.]

WYANDOTTE, KAS., December 14, 1880.

To Parker Earle, President Illinois State Horticultural Society, Warsaw, Ill.: The State Horticultural Societies for Kansas and Missouri, holding joint sessions at this city, take pleasure in hereby forwarding greetings to their horticultural brethren in Illinois. We are laboring not for ourselves, but for the good of a common humanity. May God bless our efforts.

E. GALE, and
N. J. COLMAN,
Presidents.

COMMITTEE ON JOINT SESSIONS.

On motion, a committee of conference, consisting of F. Wellhouse, Samuel Reynolds and J. W. Robson, were appointed to arrange for joint sessions with the Missouri State and the Missouri Valley Horticultural Societies, which had assembled in annual session at Kansas City, Mo.

COMMITTEE ON ORDER OF EXERCISES.

On motion, M. B. Neŭman, Wm. Cutter and Joseph Savage were appointed a committee to arrange the order of exercises during the meeting.

COMMITTEE ON CREDENTIALS.

On motion, a committee on credentials, consisting of A. R. Gillett, H. E. Van Deman and E. P. Deihl, was appointed.

REPORT OF CONFERENCE COMMITTEE.

The committee recommended that the sessions of the Society be held, after the present day, jointly with the Missouri State and Missouri Valley Horticultural Societies, at Alcott's Hall, Kansas City, Kas. On motion,

REPORTS BY COUNTIES ON THE FRUIT CROP FOR 1880,

Were made the subject for consideration.

JOHNSON COUNTY.

B. S. McFarland, Olathe: The condition of the fruit crop for 1880 was most excellent, and the present condition of orchards is good.

E. P. Deihl, Olathe: The Alexander, Early Louise, Hale's Early and Amsden's June peach trees bore us a full crop.

COWLEY COUNTY.

A. R. Gillett, Winfield: Condition of orchard trees good. The freeze of April 30th cut off most all our fruit. Small fruits will not succeed without a mulch.

LABETTE COUNTY.

C. G. Wickersham, Parsons: Have succeeded with all classes of fruit. Of early-ripening apples, Williams's Favorite is one of the best; the Early Harvest, Maiden's Blush, Swaar, Winesap, Missouri Pippin and White Winter Pearmain all produced fine crops. Pears—The Petite Marguerite is a new and very promising variety; I have 1,000 standard and 250 dwarf trees in my pear orchard; most are too young to fruit; the Howell, as a dwarf, produces fine fruit. The peach crop was fine; wood growth, good. Cherry crop was good. Of pears, I sent your Secretary, for display at the Western National Fair, twelve specimens, which weighed twelve pounds and thirteen ounces; second lot, twelve specimens, which weighed twelve pounds and four ounces; these were of the Duchesse d'Angouleme variety.

LEAVENWORTH COUNTY.

F. Wellhouse, Fairmount: The crop of Missouri Pippin and Ben Davis in my county was splendid; I believe Leavenworth county has realized over $100,000 from its apple crop this year.

E. J. Holman, Leavenworth: Peaches—The early varieties produced a fine crop, such as Alexander, Amsden, Early Beatrice, Hale's Early; Cooledge's Favorite, Troth's Early, Old Mixon and Smock did not fruit as well; Salaway is not profitable; Heath and a late yellow freestone were the most profitable. Apricots—Of eight varieties tried, the Early Violet only was satisfactory. Nectarines—The Boston did well. Cherries—May Duke and Reine Hortense bore a fair crop; none were as profitable as the English Morello, exceeding even the Early Richmond; have found the late varieties more profitable than the early ones. Pears—Have had no blight for years past; the Bartlett, Howell, Swan's Orange, Beurre d'Anjou, Vicar of Winkfield, Seckel, Louise Bonne de Jersey and Duchesse d'Angouleme yielded a profitable crop. Apples—The crop was good of all varieties except English Golden and Roxbury Russet. Strawberries—Crop was first-rate; had best yield from Charles Downing. Raspberry—All varieties bore well except Davison's Thornless; am pleased with the Gregg; the Brandywine is more desirable for shipping than the Turner; Highland Hardy, rather tender; Norwood, immensely productive; believe it *the* berry for the western part of the State.

Dr. J. Stayman, Leavenworth: All classes of fruits except peaches have been successful the past year. Do not believe peaches will succeed. Have had two crops in twenty-one years. The Cuthbert raspberry fails to sustain its high character obtained in other States.

ALLEN COUNTY.

H. E. Van Deman: Apples were a good yield. Peaches—Amsden's June, Alexander, Early Beatrice and Early Louise bore satisfactorily; Old Mixon Free, the Crawfords and Foster failed; Ward's Late Free, the Indian classes and Heath Cling, produced a heavy crop. Cherry—Early Richmond, English Morello, bore well. Small fruits—fine crop. The Snyder blackberry is productive—berry small, plant hardy.

Adjourned.

AFTERNOON SESSION.

Tuesday, December 14, 1880.

President Gale in the chair. Fruit-crop reports continued.

DOUGLAS COUNTY.

S. W. Pearson, Lawrence: Apples—Bore heavily. Seedling varieties, Missouri Pippin, Winesap, Rawles Genet, Ben Davis. Peach crop, light.

E. A. Coleman, Lawrence: Apple crop, heavy; pears, next to a failure.

C. W. Murtfeldt: Have checked rust on the leaves of the blackberry and raspberry, by removal of affected plants, and an application of sulphur to the land. The Green Prolific strawberry is the most profitable variety for all purposes in a family.

The Committee on Credentials reported the delegate attendance, which was filed for publication.

An essay on "Handling and Marketing of Fruits," by P. M. Keily, St. Louis, Mo., was read by Col. N. J. Colman. [This article will appear under the proper heading, in the department, "Reports of Standing Committees."—Secretary.]

On motion, a vote of thanks was tendered Mr. Keily, for his interesting paper.

Adjourned.

EVENING SESSION.

TUESDAY, December 14, 1880.

President Gale in the chair.

ADDRESS OF WELCOME.

The following address was delivered by M. B. Newman, Secretary of the Wyandotte County Horticultural Society:

Mr. President, and Gentlemen of the Kansas State Horticultural Society: Through the unexpected absence of the Mayor of our city this evening, I am called upon to deliver to you the address of welcome to Wyandotte.

Numerous reasons combine to render this annual meeting of your Society here especially gratifying to us.

First, we have been accustomed for years past to read with both pleasure and profit the proceedings of your Society in your annual publications, and have thereby become imbued with an interest in your discussions which we believe will be of still greater interest as we receive them through the utterances of your voices and the magnetism of your personal presence with us.

Secondly, we claim here that we have the banner fruit county of the great fruit region of Kansas. That we have contributed from our orchards and gardens very many of those remarkable pomological specimens that have acquired for our young State, at the National and other leading fairs, our splendid reputation as a fruit-growing region. Hence, we are peculiarly gratified with the opportunity now furnished of making an exhibition of our remarkably fine orchard products to the Society which has so indefatigably labored to spread abroad the wonders of Kansas pomology.

Next, we not only boast here of the success of our orchard products, but we also claim the location here of the inevitable future commercial emporium of our State; and as this will become a matter of special interest to the enterprising fruit growers of Kansas, we will take great pleasure during your stay in Wyandotte in showing you our location and peculiar commercial advantages in prospect.

Finally, by special arrangement, the State Horticultural Society of Missouri, (our sister State, which shares with us those special adaptations to fruit culture which render the whole region so peculiarly attractive to pomologists,) has convened at this time in our sister city across the Kaw, and we anticipate the unusual pleasure of many joint meetings during this session, whereby increased interest and profit are to be expected from the discussions of this session. And as we call to mind the many fruit growers of Missouri whose names have become inseparably connected with the horticultural literature of the West, we feel a special pleasure in the opportunity here to be enjoyed of forming their more intimate acquaintance, and of listening to the words of wisdom and experience that they will afford to the discussions of our present session.

For all these and many other considerations, you are welcome, most cordially welcome, to the hospitalities of Wyandotte.

RESPONSE,

BY PRESIDENT E. GALE.

In response to your very pleasant and frank greeting, I cannot do otherwise than express the hearty appreciation of the Kansas State Horticultural Society. We meet, not to promote individual interests or to conserve personal ends merely, but to consider questions that underlie the material interests of the entire State. We come hoping to receive encouragement at your hands, to gather much for our common good from your personal experience, and in return hope to aid in deepening our common interest in horticultural pursuits; and we are now sure that we are not to be disappointed. As we shake hands over the line with the State Horticultural Society of Missouri, through her honored President, we feel that this meeting is full of significance, and pregnant with rich promises for the future. We take a peculiar satisfaction in annihilating State lines, and for the time being forgetting whether we belong to Kansas or Missouri, and work to promote our common cause. In behalf of the State Horticultural Society of Kansas, I most cordially thank you.

HORTICULTURAL FARMING.

BY C. W. MURTFELDT, KIRKWOOD, MO.

Perhaps there is no State in the Union where horticulture and silva-culture are of greater importance or play a more conspicuous part than they do in Kansas. This is a universally acknowledged fact. Prairies of miles upon miles are yet almost treeless. It is true the railroad companies have done considerable to encourage tree planting alongside of their respective lines. The Government also has offered a premium in lands to each and everyone who will cultivate a certain area of trees; but both together have made but little headway, comparatively. There is no question but that the liberal planting of trees all over the State of Kansas would materially modify the climate, and tend to develop a more even distribution of moisture in the shape of rain or snow. At present the rainfall may be sufficient in quantity to favor the production of crops, but it comes in torrents and too much at a time, and thus frequently does more damage than good — washing out or hardening the surface of the earth, and producing floods in the larger streams.

As a case in point, it will not be necessary to go to Egypt, but to cite that of a more recent date in Spain. Only a few years ago, Spain, being embarrassed for funds, denuded vast areas of her territory of timber, which she sold. Last year, cloud-bursts and violent storms were the rule, and gentle and fructifying showers the exception, especially on the denuded portion of her dominion.

Viewing the subject from this standpoint, there should be a very liberal planting of trees on every farm in Kansas; and for this occasion it will be my object to speak more especially of the cultivation of fruit trees, or *farmers' horticulture.*

In what respect, Mr. President, does farmers' horticulture differ from the horticulture of other men? It is a well-known fact, horticulture in its strict sense, means the cultivation of a garden; but in its generally-accepted sense at the present day, it means the cultivation of fruits, flowering plants and ornamental trees. And in this latter sense will this paper treat the topic.

The farmer makes the growing of grain or of live stock of various kinds, or dairying, his main and principal business, and the horticulture which he practices is only incidental, though it ought not so to be, (*i. e.*, if by incidental, is meant haphazard or happy-go-lucky!) as I shall endeavor to show further on. In passing, allow me to remark that this Society is itinerant, and that is a good feature. New localities are visited every year, and many persons not members can and do attend the annual sessions, and are thus afforded opportunities to gain information and to behold displays of fruits, which, without this itinerancy, they could or rather would never have done. There are always present persons who have come to learn (and by the way, all such ought to become members at the first opportunity) concerning the fruits that may be grown in their own vicinity, where, possibly, they have not lived long enough to become acquainted with the horticultural possibilities of their own soil.

Nothing very new or startling can be said upon so trite a theme as farmers' horticulture. As in religion, so also in horticulture—the great majority of the people need "line upon line and precept upon precept—here a little and there a little;" indeed, we all do, because we are prone to let things slip which once we knew very well. Do you say you doubt my statement? Very well, sir; just try your knowledge of varieties of apples or pears, for instance, especially if you but recently have come from the Eastern, Middle or Southern States, and compare notes—and let me know the result, if you please.

It is my object in this paper to place the farmer's horticulture in juxtaposition to that of the specialist, viz., the nurseryman, florist, orchardist, or vine dresser. No prudent man will enter upon the calling of either without considerable practical experience and capital; but any farmer may—nay, *should*—venture a little into each of these. If he fails, it will be upon a small scale only, and he can recover or amend as occasion may require. As just hinted at, a farmer's horticulture differs in no way from the horticulture of the specialist, except in the quantity or area cultivated to orchard, vineyard, or garden. In order to succeed, the farmer must cultivate, prune, dress or train his trees, vines, berry plants or flowers as scientifically correct and as faithfully as he who has made these things the one pursuit of his life. He must prevent the incursions and depredations of fungi, blight, insects, etc.; in fine, he must be just as dexterous and thorough in his fruit growing as he is in his dairy, or the cultivation of grain, or the raising of live stock, because, as first above written, or hinted at, "whatever is worth the doing is worthy of being well done!" And therefore the farmer must be willing to devote the necessary outlay of thought, money and time to the production of fruits for his own table, and flowers and shrubs for his own and others' pleasure, that the specialist does to place these things on sale. As a rule, men place but little value upon that which costs them little.

And now comes the question, will it pay? Many men insist that their every undertaking shall be submitted to this crucial but preposterous test. Will it pay? No, sir, not if you are content to live upon hog and hominy, or bacon and greens; if you simply eat to live, or live to eat, that which will sustain life for a few years, and, after transmitting scrofula, bad looks and general debility to your possible posterity, will send you to a premature grave, leaving your pelf, for which you have sacrificed so much, to your babes, or, worse, to the lawyers. Again comes the question, will it pay? Before giving an affirmative answer, allow me to ask a question or two: Do you desire to enjoy the good things which a kind Providence has placed within your reach? Do you like a variety of diet? Do you value good health? Can you enjoy the beauties of nature? Do you love to see the glory and to inhale the perfume of apple blossoms? Do your nostrils distend when you come near the vine when it is in bloom? Do your eyes and your nose feast upon the bloom and fragrance of the rose? Do you enjoy the sweetness of the violet, the heliotrope, the jessamine, and the mignonette? And in late spring or early summer does your palate thirst and long for the refreshing acid of the strawberry, the cherry, or the orange? Have you any relish for the luscious peach or juicy pear? And thus I might go on, naming all the fruits in their season. If you say yes to these questions, there will be no need of my doing so; if you say *no*, you ought to be put upon a diet of raw turnips for your natural life.

But says one, "Why talk of science in horticulture? Horticulture is only an art." Let Webster answer; he defines science as *knowledge* or *certain knowledge*, and says a little further: "or a principal in science is a rule in art." Some one else defines science as classified facts. Take the process of grafting in its various forms, or of budding or transplanting, or layering: one must have a *certain* knowledge of the *how*, the *why* and the *wherefore*, as well as the art of manipulating with care and expedition the thing in hand, to produce a certain result. "The *science* of music is a correct theory thereof; the art is the *practice;*" and as one cannot learn to play well and skillfully upon an instrument without constant, persistent and intelligent practice, so also one cannot learn to graft, bud or transplant trees, shrubs or flowering plants with a certainty as to result, without a good deal of study and intelligent practice.

But it may be asked, "What has all this to do with your theme?" ***Much, every way***, as I shall endeavor to show. A farmer wants but a limited number of trees, or vines, or plants, because he intends raising fruits and berries, or grapes for his own and family use only, and not for market. Had he not better go to some well-established and reputable nursery and procure what he wants in kind and variety, than to grow trees and plants from the seed, and next graft and bud, and wait long years before he can reasonably expect to partake of their fruit? And so with ornamental plants. These things, if procured as suggested, are superior in kind, quality and variety to any he can hope to produce, and besides, generally they are prepared for transplanting, and true to name. Thus the farmer saves time, money, and a very probable disappointment.

And now, without claiming at all to be a model cultivator, (really, I have not, for want of time to do and opportunity to secure efficient help, been able to do a fraction as well as I could have done under other circumstances,) nor anything but a farmer practicing a farmer's horticulture, allow me, notwithstanding, to give my experience of the year A. D. 1880.

On a space of about one acre, devoted to fruits, we had strawberries for over two weeks, commencing about three days later than the earliest maturing in our vicinity. Varieties: Wilson, Charles Downing and Green Prolific. These were succeeded immediately by raspberries, both black and red, of the cap varieties. These in turn were followed by the Early Richmond (tart), and some sweet cherries. The latter would have been more abundant had not the birds taken the lion's share in the forced partnership. Next came the blackberries, and with these, peaches. On June 25th we had the first prematurely-ripened peaches — the Amsden; but within ten days thereafter and while the blackberries were still abundant, we had from two trees of the above-named peach about five bushels. These would have been of better quality had the fruit in its earlier stages of growth been more severely thinned out. The Amsden was followed by the Hale, and this in turn by the Early and Late Crawford and some very good seedlings, both tart and sweet. *In all, we enjoyed the luxury of peaches and cream for full ninety days, or one-fourth of the year.* In the meantime we had a few varieties of summer apples and early autumn apples, in profusion, all of which would have been esteemed choice had the other fruits been less abundant or fine. After the peaches were gone we still had autumn and winter apples so plenty that, after all our efforts to give away, to preserve by canning, to dry and to convert into apple butter, there were absolutely *wagon-loads* that decayed under the trees.

Were I to go into detail and speak of our enjoyment (and this includes visiting friends) of the flowers, shrubs and ornamental trees, I fear you would call me an enthusiast or something not quite so complimentary; therefore I will not weary you with the recital of this part or branch legitimately belonging to my subject. Will anyone yet ask the question, "*Will it pay?*"

What has been accomplished by your humble servant on so little ground is certainly within the reach of every farmer owning a small homestead. And allow me here to say, that there ought to be printed a greater number of Kansas Horticultural Reports; and these ought to be distributed, not *wastefully*, but more *generally*, to the farmers of Kansas.

—Since the foregoing was written, I have had opportunity to visit southern Kansas, as far west as Wichita; and I have been surprised as well as pleased to notice the numbers and extent to which orchards have been planted in that section of the State. They looked to me of sufficient age to have produced all the fruit needed in this section, yet apples are taken to Wichita by the carload. Were I to go into this section to live by farming, I would plant some varieties of apples noted for their proneness to early bearing, even if the varieties were of indifferent quality. They could be removed when those of superior quality became abundant. Again, I would plant at the least, half a bushel of peach seeds, both for fuel and fruit, and I would add to these as I had opportunity, thus adding constantly to the number of growing trees, which would benefit not only myself, but the community and the State.

PORCHES, PIAZZAS AND GABLE-ENDS.

BY J. W. ROBSON, CHEEVER.

The early settlers of Kansas had from necessity to be satisfied with a log cabin, or one built with sods, and many on the uplands, for a shelter, had to be content with a dug-out on the face of some deep ravine, to protect himself and family against the inclemency of the seasons. There was no beauty or design in their construction, but simply plain walls with a roof to cover, windows to admit light, and a door to enter. They were well and strongly built; they afforded perfect protection to the physical nature of man; and they served, so far as houses composed of these materials could serve, all the most imperative wants of the body. While lacking convenience, they were warm and comfortable.

But the settlers on these broad plains have reached the transition state, when the merely useful in the construction of a home does not satisfy, and now a house is needed not only for the physical wants of man, but for his moral, social, and intellectual existence. If hospitality smiles in ample parlors; if home virtues dwell in cozy fireside family rooms; if the love of the beautiful is seen on its shady porch, its upward-pointing gables, with its intricate tracery of climbing plants, and its walls covered with vines and flowering shrubs, we feel at a glance that here we have reached the highest beauty of which domestic architecture is capable—that of individual expression.

It must appear reasonable to every thinking mind, that the cottage form in architecture is one of the embellishments of natural scenery which deserves attentive consideration. It is beautiful always and everywhere; and whether looking out of the woody dingle with its eye-like window, and sending up the motion of azure smoke between the hoary trunks of aged trees, or grouped among the bright corn fields of the fruitful plain, or forming bright clusters along the ridge slope, the cottage always gives the idea of a thing to be beloved—a quiet, life-giving voice that is as peaceful as silence itself.

The principal thing worthy of observation in a finished cottage is its all-pervading neatness and the expression of tranquil repose. The swallow, martin and wren are each permitted to attach their domiciles in undisturbed security to the eaves; thus enhancing the effect of the cottage by increasing its usefulness and making it contribute to the comfort of more beings than one. The white of the walls is stainless, and its bright surface catches a side light as brightly as a front one; the luxuriant rose is trained gracefully over the window, which, half opened, admits the breeze, that, as passing over the sweet brier planted below, fills the room with fragrance.

The bright wooden porch breaks the flat of the cottage face by its projection, and branches of the grape-vine and wandering woodbine flaunt themselves in the sunlight. A few square rods of garden laid down to grass, with here and there large masses of fragrant flowers and flowering shrubs, complete a picture which is nearly a perfect thing in its way. The ideas it awakens are agreeable, and the architecture is all that we want in such a situation. It is pretty and appropriate, and if it boasted of any other perfection it would be at the expense of propriety.

We had no intention, when we began this paper, of writing a dissertation on cottage architecture, but simply to note down the experience and thoughts of the many flower-lovers who are scattered all over our State. As chairman of the Committee on Hardy Ornamental Flora, I have corresponded largely with citizens who take a deep interest in home adornment. Here is a rich flower-piece from southern Kansas:

"For home ornamentation we have the trumpet creeper (*Tecoma radicans*). To see its real beauty, we must stand at some little distance from the vine. One of ours reaches now up to the comb of our barn, and there spreads over the martin box. No girl ever looked jauntier with a rose in her bonnet, than does that little bird-house up there, within the surroundings of that vine. On the west side of our house we have one spreading over the wall, and at one corner of the front porch another, and we like them. But the wisteria on the front has lofty aspirations. It has grown very strong and vigorous. It receives the praise of every one who looks upon its large clusters of pale-blue fragrant flowers. And while I am at it, let me say, that the old-fashioned sweet brier occupies a very cold corner, and it grows and flourishes, and yields its pleasant perfume. Several Prairie Queen roses are attached to our dwelling, and on the palings around the yard. Shame that in south Kansas — all Kansas — there is not a greater profusion of flowers!"

Ah! my friend, the Ideal and the Real the world over are pretty much the same; and when we seem to be chasing the Real, as we think, we gather the less of it than we would, if we set more store by the gentle realities that you seek to promote.

Another writes thus: "The gable-end of my old log cabin is prettier than any picture that ever came from the studio of an artist. The whole space, excepting the windows, is closely covered with the Virginian ivy (*Ampelop-*

sis). An old fence wire is fastened to both angles of the cornice, along which two bittersweets (*Celastrus*) have entwined themselves lovingly. When studded thickly with clusters of bright yellow berries, they make a pretty frame for the ivy picture, when the leaves are of the richest green, and still more so, when the berries, late in the autumn, burst open, and assume a red and crimson livery, and inclose a foliage brilliant in orange, scarlet, crimson and purple. On both sides of the porch I have two sumac shrubs (*Rhus*), which makes a gorgeous display of foliage in the fall of the year. A clematis, dug out of the woods, covers the open frame-work. I can tell you these three climbing vines make the old cabin look lovely. With these I am satisfied, and have no desire to see a foreign vine rambling over my home."

A lady correspondent in central Kansas thus writes: "I have a scarlet trumpet honeysuckle growing on my porch which completely covers the whole surface, and for six months in the year has a profusion of bright scarlet blossoms. On one side of the porch the wall is covered with a Prairie Queen rose; on the other side, a Baltimore Belle. These occupy the whole bare wall of the gable-end. It is pleasant to see the bright pink and pure white flowers intermingle. A wisteria planted at the corner, runs up the lightning-rod and along the ridge-pole. I can assure you the porch and gable of my 'wee' house look quite animated and are much admired."

A lady residing up the Solomon valley, communicates the following: "My piazza is twenty-four feet long; the roof is supported by six slender pillars. The support on the south corner is covered from base to capital with a Prairie Queen rose; the second with a monthly honeysuckle (*Lonicera belgiaca*); the third with a Baltimore Belle rose; the fourth with Hale's honeysuckle (*L. Halleana*); the fifth with the Seven Sisters rose (*Rosa grevillea*); and the sixth with a wisteria. The north end is inclosed with morning glories; the south with Madeira vine. Both of these are trained on perpendicular wires, as twine supports break so easily. My piazza is fit for a queen to repose in. I use it more during the warm summer months than any room in the house during my leisure hours. It is just lovely."

A lover of the practical in cottage adornment, thus writes: "My porch is innocent of climbing roses and vines, but I have it covered with Concord and Hartford Prolific vines. What a grateful, cooling shade these vines afford! And not only so, but a great abundance of luscious fruit. The gable faces the south, and over its surface the old Catawaba grape is trained. What rich-looking clusters! I verily believe this to be the finest red variety, when fully ripe, and it always ripens with me."

"I wish you would come and look at my new climbing vine," said a little friend to me when passing her home. Here was a pretty vine, with deep green delicate foliage, growing vigorously up the corner of the house. We need not say we were surprised, and while gazing in mute astonishment, our friend broke the silence by saying, "Come look at my bay window;" and here she had another plant of the same species, rambling luxuriantly over a bracket and encircling a picture frame, rivaling the smilax in graceful beauty. "Isn't that fine?" said my little flower-lover. "Yes, Annie, you little rogue, but it is only *a wild buckwheat!*"

A lady horticulturist of Chase county, states in her note, that she cultivates a large number of climbers, and judging from the list sent, she cultivates a larger number of species and varieties of climbers than any other lady in Kansas. In closing, she expresses the hope that the time will soon come when they shall cover the porches, piazzas and gables of every cottage in our beloved Kansas, and cause it to "blossom as the rose." I can only add a hearty and loud AMEN!

Adjourned to meet at Alcott's Hall, the next morning.

MORNING SESSION.

WEDNESDAY, December 15, 1880.

The Society assembled in Alcott's Hall, and held joint session with the Missouri State and Missouri Valley Horticultural Societies; N. J. Colman, President of the Missouri State Horticultural Society, presiding.

Prayer was offered by Geo. T. Fairchild, President of the Kansas Agricultural College.

ORNAMENTAL TREES.

On this subject, the following discussion was had:

C. W. MURTFELDT: With proper treatment, most of the common varieties of evergreens succeed. The balsam fir and juniper family are the most difficult.

H. E. VAN DEMAN: It is well known that some varieties of trees are tender in their youth, but if nursed for a few years will succeed thereafter. I do not know of a hemlock of any size in Kansas.

PRESIDENT GALE: I can most emphatically indorse the list recommended by Prof. Husman, excepting the white pine, which is not a success; Norway spruce, where protected, may succeed.

TELEGRAM.

The Secretary announced the receipt of the following telegram, and discussion was suspended for its reading:

WARSAW, ILL., December 14, 1880.

To Prof. E. Gale, President Kansas State Horticultural Society: We shake hands with you and the societies you represent, across America's great river. Our common mission, preaching and practicing horticulture, the gospel of agriculture, unites us all in one great Western brotherhood.

PARKER EARLE,
President Illinois State Horticultural Society.

DISCUSSION ON ORNAMENTAL TREES — RESUMED.

DR. G. BOHRER: In Rice county, and a large portion of the Arkansas valley, evergreens do not succeed, partly because they are not received in a healthy condition, and their non-adaptation to the climate. Those planted early in March do far better than later-planted ones.

J. B. SCHLICHTER: There is an evergreen introduced to the Arkansas valley, from Nickerson, which succeeds. Red cedars are found natives in the valley as far west as the west line of the State.

DR. CHARLES WILLIAMSON, Washington: Cedars are hardy and thrive in my county. I have found seedlings springing up under the forest trees in Atchison county.

H. PERLEY, Spring Hill: The Norway spruce succeeds in Johnson county, and I can see no reason for hesitating to plant the common varieties of evergreens.

A SADLY-NEGLECTED TREE.

BY J. W. ROBSON, CHEEVER.

THE ASH-LEAFED MAPLE (*Acer negundo*).

Few if any of our native forest growths have so many local names as this useful tree — Box Elder, Honey Maple, Ash-Leafed Maple, etc. There has also been considerable confusion among botanists, both as regards its proper generic and specific terminology, called by some, *Negundo aceroides;* by others, *Acer negundo;* and still later it has been christened by some scientists, *Acer fraxinoides.* We have noticed, also, *always* when introduced to the attention of horticultural societies, that the bare mention of its name has produced a smile, and in some cases a slight curl of the upper lip — sometimes finding vocal utterances in a sneer.

In every prairie State where persistent advocates would insist on proclaiming its merits, they would be very benevolently tolerated and permitted to have their say; still it was an accepted opinion of the majority, that they were afflicted with the box-elder craze, and had *Negundo* on the brain. Such, indeed, has been the experience of the writer of this paper, whenever during the last thirty years he has urged the claims of this product of our native groves, or endeavored to dispel the widespread prejudice which exists in so many minds against its use for protective purposes. And yet, notwithstanding the experience of the past, we want once more to be put on record regarding its value to the pioneer settler, believing as we do that this is the tree of civilization destined to redeem our magnificent Kansas plains from their thralldom of winds, drouth, grasshoppers and desolation, and eventually make them not only a good pastoral and agricultural region, but a garden fitted for all horticultural products, and if we are only true to the trust reposed in us, will make these plains what they were intended for — the garden of the world.

FOR PROTECTION, the ash-leafed maple is invaluable, being of dense and rapid growth. The young seedlings attain the height of two and three feet, and make an average growth of four feet per year, forming a beautiful head. It has no superior among native trees—we mean our soft woods—in its ability to withstand the severest wind storms.

FOR FUEL, it is is excellent, as it produces a large amount in a very few years. Four acres well cultivated will supply all the fuel a farmer needs, at six years from the seed.

FOR HEDGE, it bears crowding in single line better than any other native tree. Its extreme tenacity of life, hardy nature, and dense, hedge-like head, give it all the necessary attributes which a hedge plant ought to possess. On our farm we have an ash-leafed maple hedge one hundred rods long, which was admired by all who saw it last summer.

FOR SUGAR.—It produces a fine flavored sweet, in great abundance. In Illinois, it has been planted extensively in orchard for sugar making. A small tree six inches in diameter will yield half a gallon of sap per day.

FOR HOG PASTURES.—It is ahead of all trees for shade, and what is better still, the hogs will not destroy it or injure it as they do other trees. In a healthy, rapid-growing condition, it is insect-proof. Grasshoppers never touch it; no caterpillars molest it.

In further confirmation of our statements, let us listen to the

VERDICT OF THE JURY.

"It is beyond all question hardy, even in the most exposed positions. It grows on rich soil with great rapidity. No tree in our State is so free from insect enemies." (Judge C. E. Whiting, Iowa.)

"The experiments of your committee give the following showing:

"1st. That the ash-leafed maple produces more sap than the sugar maple.

"2d. The sap is richer in sugar than the other, the yield of dry sugar averaging two and eight-tenths per cent. of the weight of sap.

"3d. The crystalization takes place *always*, unless the sap was soured before boiling, or unless it was so badly burned that the sugar was carameled.

"4th. The sugar produced is whiter than that from the sugar maple treated in the same manner." (H. H. McAfee, Iowa.)

"As the State Horticultural Society is fast becoming good authority, I respectfully suggest as subjects for further inquiry, by your worthy body, that each one to whom these presents come constitute himself a committee to ascertain the truth. For myself, from actual experiments, I am convinced that box elder is a valuable sugar producer. In my hands evaporation produced a syrup, and sugar in every respect, in taste and appearance, like the sugar maple." (Smiley Shepherd, Illinois.)

"It is rich in saccharine sap, which makes an abundance of light-colored, well-grained sugar, *almost identical in flavor with that made from hard maple.*" (Jonathan Periam, Illinois.)

"The average growth of ash-leafed maple in *twelve years* from planting, is one foot diameter of *stem*, and twenty feet high." (O. B. Galusha, Illinois.)

"The seeds are easy to gather in nearly every portion of our State, and require no more skill in handling than those of soft maple. Grown thickly in artificial groves, the trunk runs up straight and tall. For protective purposes on the open prairie, it is the tree for the million." (I. L. Budd, Iowa.)

"It succeeds well around Denver, Col., and as far west as Fort Benton, on the Missouri river." (Forestry Report, U. S. A.)

Kansas, Nebraska, and Dakota Territory, contain an area of level plain of immense extent. The bane of this great region is drouth, which is in part caused by its altitude; but is also owing to a great extent to its treeless condition, and the consequent rapid evaporation of what moisture is derived from the atmosphere. But one course can be successfully pursued to redeem this region from its semi-desert character. Trees by the millions of millions must be planted; at first the species that will stand the drouths, parching heats, and sweeping winds, afterwards, other species as the untoward conditions are ameliorated. For this work the ash-leafed maple is indispensable.

The renovation of this great region is a work too great for individual enterprise; it needs the help and fostering care of State Legislatures, of the General Government, and the energetic action of the great railroad corporations which already own half the land to be benefited.

The instincts as well as the education of civilized man, lead him to procure such conveniences as will give him the most comfort for a given amount of labor and money. In the settlement of a new State, he is often obliged to take up with such means as are nearest at hand, however inconvenient they may be. Timber has always been considered so absolutely indispensable, that its total absence would be completely fatal to the planting of colonies, or the opening of farms. Hence, the early settlers to this State settled along the streams skirted with timber, or nestled in some beautiful grove, which here and there stood out from the rivers, as though to teach the next comer a lesson of wisdom, showing him how he may appropriate the resources of nature, and by faithful labor, secure for himself and his children, even upon the open plains, the same advantages which *she* has provided for the early settlers on more favored spots. Alas! how few heed these teachings of nature.

In conclusion, we would appeal to you, members of the Kansas State Horticultural Society, and through you to every farmer in the State, in behalf of your own and your children's best interests, as well as the future prosperity of our beloved commonwealth, that you consider this subject carefully, using all the means within your reach to prove either the truth or the fallacy of the statements contained in this paper. We have investigated this subject thoroughly, and we know that the statements we have made are true. For thirty years we have been watching this tree, and have fully tested its adaptability to our arid plains. We have been collecting facts in relation to the various uses to which it may be applied, and now we present the result. We now leave the case in the hands of the citizens of this young and growing State.

PROF. HUSMAN: The box elder is subject to injury from the flat-headed borer. This tree succeeds in northern Kansas, and is superior to elms.

MISS M. L. MACY: Its wood is valuable for cabinet uses.

Adjourned.

AFTERNOON SESSION.

WEDNESDAY, December 15, 1880.

The Society held an executive session in the Congregational church at Wyandotte; President Gale in the chair.

The first business was the reading of the Treasurer's and Secretary's annual reports:

TREASURER'S ANNUAL REPORT.

From December 14, 1879 to December 14, 1880.

RECEIPTS.

Dec. 14, 1879—Balance in treasury	$162 33
Jan. 17, 1880—A. A. Adams, Garnett, second installment, life fee	2 50
Jan. 22—A. J. Pope, Wichita, annual fee	1 00
Feb. 2—T. Walker, Parsons, annual fee	1 00
Feb. 2—Y. Covalt, Parsons, annual fee	1 00
Feb. 16—T. Nixon, Arguile, annual fee	1 00
March 2—Loan, National Bank, Lawrence	200 00
May 31—Loan, Douglas County Bank, Lawrence	100 00
July 10—State appropriation	2,500 00
Dec. 14, 1880—Total	$2,968 83

DISBURSEMENTS.

Dec. 18, 1879—Balance due Secretary's office	$98 13
Dec. 18—President's expense bill	6 95
Dec. 18—Secretary's expense bill	7 35
Dec. 30—Prof. C. V. Riley, insect cuts	37 00
Dec. 30—Cost of money order	20
Dec. 31—Secretary's monthly expense	14 40
Jan. 1, 1880—F. Wellhouse, office bill	4 65
Jan. 1—H. E. Van Deman, experimental work	10 00
Jan. 27—Prof. C. V. Riley, insect cuts	13 00
Jan. 27—Cost of money order	10
Jan. 31—Secretary's monthly expenses	22 33
Feb. 28— " " "	5 87
March 31— " " "	11 90
April 26—J. W. Robson, experimental work	15 00
April 26—Cost of money order	10
April 30—Secretary's monthly expenses	18 28
May 31—Secretary's monthly expenses	14 85
June 1—H. E. Van Deman, Trustee, expense bill	10 00
June 26—President's office, expense bill	4 90
June 30—Secretary's monthly expenses	60 51
July 10—National Bank, Lawrence, (loan, March 2,)	200 00
July 10—Interest on same	8 75
July 10—Douglas County Bank, Lawrence, (loan, May 31,)	100 00
July 10—Interest on same	1 55
July 10—G. W. Martin, printing Vol. IX, and job work	1,600 00
June 12—A. Gast & Co., St. Louis, Mo., 2,500 lithograph engravings, Dr. Wm. M. Howsley	70 00
June 12—Cost of draft	25
July 31—Secretary's monthly expenses	32 41
Aug. 31— " " "	26 37
Sept. 30— " " "	22 02
Oct. 30— " " "	8 25
Nov. 30— " " "	6 25
Dec. 14— " " "	10 00
Dec. 14—Secretary's salary for 1880	500 00
Dec. 14—Total	$2,941 37

RECAPITULATION.

Total receipts	$2,968 83
Total disbursements	2,941 37
Balance in treasury, Dec. 14, 1880	$27 46

F. WELLHOUSE, *Treasurer.*

On motion, the report was approved.

SECRETARY'S ANNUAL REPORT.

BY G. C. BRACKETT, SECRETARY.

Mr. President, and Associate Members: At this the close of the fourteenth year of our organization, we have assembled to deliberate upon the results of our efforts as members in the field and as an organized body, during the interval which has passed since our last meeting. I will first call your attention to the proceedings of your Board.

The first meeting of the Board was held in the parlor of the Park Hotel, at Holton, on the evening of the 17th of December, 1879, immediately following the close of the thirteenth annual meeting. The chairs of the standing committees were filled as follows:

Nomenclature—Prof. H. E. Van Deman, Geneva.
Botany and Vegetable Physiology—Prof. J. W. Robson, Cheever.
Entomology—Prof. F. H. Snow, Lawrence.
Orchard Culture—F. Wellhouse, Leavenworth.
Forestry—M. Allen, Hays City.
Small-Fruit Culture—E. A. Coleman, Lawrence.
Floriculture—G. Y. Johnson, Lawrence.
Vegetable Gardening—E. J. Holman, Leavenworth.
Handling of Fruits—L. A. Walker, Independence.
Meteorology—Prof. F. Hawn, Leavenworth.
Vineyards—Dr. J. Stayman, Leavenworth.
Landscape Gardening—Prof. E. Gale, Manhattan.
Horticulture Connected with Farming—W. W. Dickinson, Wyandotte.

FORESTRY DISTRICTS.

The State was divided into two districts, commencing at a point on the east, near the mouth of the Kansas river, thence running west along that water-course and the Kansas Pacific Railway to the western line of the State. These two districts were again divided, north and south, into six belts of equal breadth, east and west, and the Secretary was instructed to obtain from the county vice presidents and other persons residing therein, a full list of native flora, the results of which appear in Vol. IX, p. 230, under the head of "Native Flora of Kansas," together with reports on methods of successful culture and management of forest trees, in Vol. IX, p. 218, under head of "Forestry." While the list is not in all probability complete, it embraces quite all classes of plants and trees of practical value to settlers in our State, and it is the intention of the Society to complete the list as rapidly as possible, that it may become a reliable catalogue for future reference. The Secretary was instructed to call the tenth semi-annual meeting at some point in the Arkansas valley, as in his judgment the interest warranted.

Board adjourned.

Second meeting was held in the officers' rooms at the Windsor House, at Hutchinson, in the evening, June 1st, during the tenth semi-annual meeting. All the members present. The Secretary offered the following circular:

MISSISSIPPI VALLEY HORTICULTURAL SOCIETY.

To the Horticulturists of the Mississippi Valley: In pursuance of action taken at the late meeting of the Missouri Horticultural Society, which embraced delegates for several other State societies, a committee was appointed to invite the horticulturists of the Western and Southwestern States to meet in convention for the purpose of effecting the organization of a Mississippi Valley Horticultural Society, and also to arrange for an extensive exhibition of fruits and flowers during the coming autumn. After consultation with horticulturists in several States, the undersigned have decided to call a convention for that purpose, to meet in St. Louis, on Wednesday, the 8th day of September next, at 9 o'clock A. M., the particular place and programme of meeting to be hereafter published.

We are also pleased to be able to announce that the Merchants' Exchange of St. Louis have, with characteristic courtesy and liberality, granted us the use of their great hall for the purpose of a horticultural exhibition; and they also guarantee the funds necessary to enable us to offer a schedule of prizes amounting in all to $2,500, which is herewith published. This exhibition will be held on the 7th, 8th and 9th of September.

We offer a very liberal list of premiums, and have encouragement to believe that we can secure the largest and best arranged display of horticultural products ever made in our country. Certainly there has never been opportunity for making so magnificent a display, as the hall of the St. Louis Merchants' Exchange is the largest and finest in America.

While the purpose of the proposers of this organization is to serve more immediately the interests of pomology, forestry and floriculture in this great Mississippi valley, yet we invite the coöperation both in the convention and in the exhibition, of all persons interested in the horticultural growth of the country, without regard to locality.

We confidently hope that lovers of pomology and rural art in all these States will join us with the enthusiasm and energy of the Western men, in the effort to make such an organization, and such an exposition of our horticultural resources, as shall be worthy of the great country in which we live.

Norman J. Colman, *President Missouri State Horticultural Society.*
J. C. Evans, *Missouri State Horticultural Society.*
S. M. Tracy, *Secretary Missouri State Horticultural Society.*
S. H. Nowlin, *Secretary Arkansas State Horticultural Society.*
C. C. Smith, *Arkansas State Horticultural Society.*
J. B. Hoag, *Arkansas State Horticultural Society.*
Parker Earle, *President Illinois State Horticultural Society.*
O. B. Galusha, *Secretary Illinois State Horticultural Society.*
J. E. Starr, *Illinois State Horticultural Society.*
H. Tone, *President Texas State Horticultural Society.*
T. V. Munson, *Secretary Texas State Horticultural Society.*
W. H. Ragan, *Secretary Indiana State Horticultural Society.*
T. T. Lyon, *President Michigan State Pomological Society.*
C. W. Garfield, *Secretary Michigan State Pomological Society.*
J. M. Smith, *President Wisconsin State Horticultural Society.*
C. L. Watrous, *President Iowa State Horticultural Society.*
J. L. Budd, *Secretary Iowa State Horticultural Society.*
M. W. Phillips, *Oxford, Mississippi.*
R. W. Furnas, *President Nebraska State Horticultural Society.*
D. H. Wheeler, *Secretary Nebraska State Horticultural Society.*
J. M. Morton, *Secretary Tennessee State Horticultural Society.*
E. Gale, *President Kansas State Horticultural Society.*
G. C. Brackett, *Secretary Kansas State Horticultural Society.*
H. W. L. Lewis, *President Gulf States Fruit Growers' Association,* (*La.*)
S. M. Wiggins, *Secretary Gulf States Fruit Growers' Association.*
J. T. Grimes, *President Minnesota State Horticultural Society.*
J. Decker, *Secretary Kentucky State Horticultural Society.*
A. Whittaker, *President Texas State Horticultural Society.*
E. N. Fielding, *Secretary Texas State Horticultural Society.*
J. A. Warder, *President Ohio State Horticultural Society.*

On motion, the Board decided to accept the terms of the circular, and make an exhibition of Kansas fruits at the time therein mentioned, and also to return the collection to Bismarck Grove for exhibition during the Western National Fair, held September 13–18 following, provided satisfactory arrangement could be made to cover transportation expenses.

An invitation from the Wyandotte County Horticultural Society was offered by its Secretary, M. B. Neuman, that the fourteenth annual meeting of the Society be held at the city of Wyandotte. The invitation was accepted, and the Secretary instructed to open a correspondence with the Missouri State and Missouri Valley Horticultural Societies, for the purpose of securing joint sessions of those societies with the Kansas Society.

Adjourned.

The third meeting was called at Lawrence, June 28th.

At this meeting the Secretary submitted a proposition from one of the high officials of the Western National Fair Association, guaranteeing free transportation to St. Louis and return of an exhibit of fruits by this Society, provided the same would be placed on exhibition at the Western National Fair for 1880. On this proposition, the Secretary was instructed to secure a collection of Kansas fruits, and make all necessary arrangements for the exhibition of the same at St. Louis during the sessions of the Missouri Valley Horticultural Society, and also at Bismarck Grove during the Western National Fair, to secure a room in Lawrence for the reception, storage and preparation of the display, and to employ all needed assistance, at the expense of the Society. In accordance with such instructions, circulars were issued calling for the necessary fruit to make up the exhibition.

Adjourned.

The tenth semi-annual meeting was called at Hutchinson, Reno county, June 1–3, in response to an invitation of the Reno County Horticultural Society. The attendance from the Arkansas valley was large, and the State was more generally represented than at any prior semi-annual meeting. The proceedings were lively and unusually interesting. The horticultural work in that valley has been in earnest—of a determined character; and while it may require years of time to solve the problem of a successful horticulture for the valley, there is every evidence that it will be accomplished and success will be the final result. Competent men are at the wheel to guide its management, and are every way equal to the task.

The proposed exhibition of fruits at St. Louis was abandoned on account of unexpected difficulties, but the efforts of the Board were concentrated towards making an extensive display at the Western National Fair, to follow. Of the success of its efforts in that direction, I will only give the opinions of such persons as have had an opportunity of viewing State displays of fruits, viz., that it was the finest collection it had been their lot to witness. A distinguished gentleman connected with the American Institute of New York for thirty years, remarked to me that the collection was superior to any that he had ever seen.

There being no funds in the Society's treasury with which to meet the expenses of the exhibition, the members of your Board cheerfully contributed of their individual funds thereto. I submit an itemized statement of the necessary expenditures, and ask that the same be referred to a committee for examination, and if considered proper, that an allowance be made:

ITEMIZED EXPENSE ACCOUNT OF FRUIT DISPLAY MADE AT THE WESTERN NATIONAL FAIR., SEPTEMBER 13-18, 1880.

Expressage	$23 81	Transfer	$10 95
Room rent and repair	7 80	Boxes and baskets	1 20
Four placards	4 00	Telegrams	5 75
Tags, wraps and labels	2 00	Collecting fruit	82 75
Freights	88	Committee lunch	5 45
Tacks, hammers, etc	1 75		
Table coverings	16 95	Total expenses	$169 19
Specimen fruit	8 40		

A statement will be published in the next annual report of the Society, giving proper credits to all contributors to the display. A resolution of thanks should be tendered by this meeting to all the contributors.

HORTICULTURAL SOCIETIES.

Since the last annual meeting the following counties have organized in the interest of horticulture: Elk, Jefferson, North Dickinson, Nemaha, Morris, Pottawatomie, Washington; Grant township, Sedgwick county. Saline County Horticultural Society, organized in 1877, placed itself in coöperation with this Society the present year.

In Kansas, at the present date, we have 41 horticultural societies, viz., 3 district, 36 county, and 2 local. Most of these societies hold meetings monthly, and under the social or picnic form during the summer season, at the residences of the members. Some add music to the exercises, and at noon, or between forenoon and afternoon sessions, a table is spread with the good things brought by the lady members, around which all gather and partake, as of one common family. In this social feature is found not only a social attraction, but an elevating influence. The kindly feelings are strengthened, and the nobler sentiments of our nature become more active and firmly fixed. *Cold* and *selfish* indeed must be the man who can see nothing attractive, nothing good in such a work, and who visits such assemblies of pleasure alone, leaving his wife and children at home "to toil and drudge the whole day long." In these local societies, to strive to accomplish the greatest good should be the aim of every member, and he who becomes an earnest devotee to this principle, surely will be appreciated as a good and useful member, and his place will be in the front and himself properly beloved by all. Selfishness in such organizations becomes one of the effectual causes of discord, distrust, and a destroyer of their usefulness. It leads to an undue estimate of the importance of the part the possessor performs, and to a feeling that he or she is not fully appreciated, evidenced by the fact that none of the important offices are bestowed upon their aspiring heads, nor are they singled out as recipients of special favors. They say they are "never made president or secretary, and that the president neglects to place them on important committees—are nothing but private members." Such become chronic grumblers, and in their frenzied aspirations for promotion, assail everybody and everything that obstructs their path to self-promotion. The good are not exempt from their scandal, and the timid shrink at their approach.

Mr. President, I have taken the liberty of this departure from the proper limits of my report, for the reason, that from personal observation and knowledge, by complaints made to this office, and to me in person, that the foregoing causes have led to the destruction of useful societies, or so impaired their usefulness as to render their existence but little better than death; and as there are with us to-day persons belonging to newly-organized societies, and others who are contemplating the forming of new ones, I cannot resist the inducement to offer these words of caution, and to point out one of the most disastrous shoals on which such societies are liable to strand and go to pieces.

ANNUAL REPORT, VOL. IX.

By order of the Board, the contract for publishing the volume was awarded to Geo. W. Martin. The edition cost the sum of $1,589.87, making a fraction over 63 cents for each copy.

Of the edition I have retained only a sufficient number of copies to supply each member of the coming Legislature. Aside from these, the issue has been distributed largely through the county societies and the county vice presidents. Sixty copies were furnished the Kansas State Historical Society, under the requirements of law; forty copies to the State Board of Agriculture; and 250 copies were donated to the State Teachers' Association, upon application of the State Superintendent of Public Instruction.

The educational field is here thrown open, and we are not only invited, but urged to enter and become coöperators with those having in charge its management. Wisdom bids us enter, and the future well-being of our State demands that we refuse not. The educational element is in accord with our work, and not only bids us God-speed, but with shoulder to the wheel, is helping to move along the load we are carrying. To say that we have the full sympathy and support of the State Superintendent of Public Instruction, is but to state a plainly-evident fact; and as an evidence that such sympathy and support prevail to a large extent among the laborers in the field of education, I have only to refer you to the extensive correspondence filed in this office from the county superintendents and teachers in our State. And more, it has culminated into a public manifestation through the columns of the *Educationist*, a representative journal. Tree planting as a necessity with a large portion of the settlers of our State, and rural improvements, the æsthetics of horticulture, are being presented through its columns with an ability and zeal worthy of our most practical and devoted horticulturists. Are not the doors to our future usefulness thrown wide open? Shall we tarry on the outside, or with alacrity embrace every opportunity presented for the consummation of the good work for which we are organized? The educational interests are assuming more and more a practical character, and will require of us a thoroughly reliable, practical work. Says one in high standing in our State educational circles: "*Your Society's report on Entomology is valuable to us because of its very practical teachings.*" May such an estimate be worthily bestowed upon our future work.

The demands for our reports are largely in excess of the present number issued, and steps should be taken to secure an appropriation in sufficient sum to increase the number annually to 5,000 copies As long as we have an active and competent organization to manage the horticulture of the State, the means should be furnished to publish the proceedings in sufficient number to supply all citizens who are interested in the pursuit with a copy.

If the agricultural interests are entitled to an issue of 8,000 copies of their reports, the horticultural are entitled to at least 5,000, and even with such edition, some will have to be denied. Through the legitimate channels of horticulture should all needed information be furnished to those engaged in the pursuit.

Of the estimate value of the report, and the work of the Society, I take pleasure in offering the following letter for your encouragement:

BOSTON, August 2, 1880.

MY DEAR SIR: I have received and perused with pleasure and profit the Report of the Kansas State Horticultural Society. Your system of operation is excellent, and cannot fail to impart just the information that your cultivators of fruit and flowers should possess. It is very grateful to my feelings to notice the tribute of respect rendered so justly to the memory of my old and esteemed friend, Dr. William M. Howsley, to whose worth I shall have occasion to refer in my next address to the American Pomological Society. The various reports in this volume are marked with more practical knowledge and ability than are usually to be found in similar publications.

Ever yours, MARSHALL P. WILDER,
President American Pomological Society.

This office is in receipt of similar letters from most of the State Societies, to whom copies of Vol. IX were sent, in exchange for their published proceedings.

PAMPHLETS ON FORESTRY AND ENTOMOLOGY.

In making up my manuscript for the departments of Forestry and Entomology for Vol. IX., the thought occurred to me that when the matter was in type it would be a great advantage to our settlers in the western portion of the State (and at a small expense) to have 500 additional copies of the Forestry report struck off, and bound in flexible covers, to distribute among those engaged in growing forest trees, who would not be able to secure the full Horticultural Report, and the same number of the report on Entomology, with which to supply the demand from our county superintendents and teachers. The thought led to action, and 500 copies of the department of Forestry and the same of report on Entomology, were made up in pamphlet form. All of the Forestry were readily called for, and only about 100 of the copies on Entomology remain undistributed. The commendations of the county superintendents and teachers on the report on Entomology have been very favorable, and in many instances, hopes have been expressed that this Society would continue its work in that department for the good of the public schools.

DEATH OF DR. WM. M. HOWSLEY, EX-PRESIDENT.

Since our last annual meeting, death has entered this Society and removed one of its most estimable members, Dr. Wm. M. Howsley, formerly of Leavenworth, who died at Central City, Neb., March 7, 1880. On receipt of this sad intelligence by the Board, the biographical sketch and resolutions found in Volume IX, were prepared and adopted, and together with a litho-likeness of the deceased, were ordered bound with that volume. Your Board desire that some formal endorsement of this action be expressed by this Society during this meeting.

INVITATION FOR THE ELEVENTH SEMI-ANNUAL MEETING.

This office has received a pressing invitation from the Cowley County Horticultural Society, asking that the eleventh semi-annual meeting be called at Winfield, and offering free hospitality and a cordial welcome by its citizens.

INSECTS — SPECIAL.

It may be known to some of you, that the canker worm has been very numerous during the past season, in some of the orchards around Garnett, Anderson county, and it has been reported to this office as prevalent in one of the nurseries near that city. Information of such a character should receive the special action of this Society. Measures should be taken to fully notify the people in every adjoining county, that the spread of this insect by the sales and transportation of trees from such a nursery may be prevented.

U. S. CENSUS DEPARTMENT.

In accordance with your instructions at the last annual meeting, this Society was placed in full and active relations with the U. S. Census Department. A formula of questions of a statistical horticultural character was submitted and indorsed by the Superintendent. Through this office, each county vice president was placed in coöperation with the work of that bureau, and the promptness with which each responded to the circulars of the Superintendent, affords great satisfaction. It should ever be made a prominent point with this Society to give every assistance to work of a National character, as well as to look after State matters properly. It will not only give us a National reputation, but through it will be derived many advantages. Thus will our field of work and usefulness become more and more extended; and will it not be wise on our part to keep ourselves ready for service?

REPOSITORY OF THE MEDALS AND DIPLOMAS AWARDED THE SOCIETY.

Security for the medals and diplomas which have been awarded this Society in the past, as well as appropriateness, led the Board to consider a suggestion that they be deposited in the rooms of the State Historical Society, at Topeka; and with reference thereto, I have the letter of the Secretary of that Society to offer you, and to recommend some action thereon:

TOPEKA, KANSAS, November 12, 1880.

GEO. C. BRACKETT, ESQ., *Secretary Kansas Horticultural Society, Lawrence, Kansas*—*My Dear Sir:* Your favor of the 10th inst., proposing to recommend to your Society the deposit of the medals and diplomas which have been awarded to it, in the rooms of this Society, is received. I have to say, that the State Historical Society will esteem it a favor to be made the custodian of the objects which are the evidences of so much glory and credit to Kansas as are those medals and diplomas. Without waiting to consult our Board of Directors, I do not hesitate to say that you can assure your Society that in case the deposit should be made, the objects will be carefully guarded, and given as conspicuous a place as will be consistent with their preservation.

Yours truly, F. G. ADAMS, *Secretary.*

The following circular letter, from the Secretary of the Missouri Valley Horticultural Society, calls for your action during this meeting:

COLUMBIA, MO., November 4, 1880.

G. C. BRACKETT, *Sec'y Kansas State Horticultural Society, Lawrence, Kas.*—*Dear Sir:* I inclose a copy of the constitution of the Mississippi Valley Horticultural Society, adopted at the meeting held in St. Louis, September 8, 1880. You will notice, that according to Article II, each State Society is entitled to choose one vice president.

Please bring the matter before the next meeting of your State Society, and report its action to me. Yours, very respectfully, S. M. TRACY,

Secretary Mississippi Valley Horticultural Society.

FINANCIAL.

Statement of Receipts and Disbursements, from December 14, 1879, to December 14, 1880.

RECEIPTS.		
1879.		
Dec. 18—	Warrant on Treasurer	$98 13
Dec. 18—	" " "	7 35
Dec. 31—	" " "	14 40
1880.		
Jan. 31—	Warrant on Treasurer	$22 33
Feb. 28—	" " "	5 87
Mar. 31—	" " "	11 90
April 30—	" " "	18 28
May 31—	" " "	14 85
June 30—	" " "	60 51
July 31—	" " "	32 41
Aug. 31—	" " "	26 37
Sept. 30—	" " "	22 02
Oct. 30—	" " "	8 25
Nov. 30—	" " "	6 25
Dec. 14—	" " "	10 00
Dec. 14—	" " "	500 00
	Total receipts	$858 92

DISBURSEMENTS.	
Postage	$125 69
Stationery	26 15
Expressage	35 60
Freights	10 05
Transfer	3 20
Telegrams	7 51
Furniture	10 25
Shipping material	6 15
Traveling expenses	8 30
Office help	6 85
Office rent, fuel, and lights	30 00
Office salary	500 00
Balance per statement, 1879	98 13
Total, Dec. 14, 1880	$867 88

RECAPITULATION.

Receipts	$858 92
Disbursements	867 88
Balance due Secretary's office, Dec. 14, 1880	$8 76

G. C. BRACKETT, *Secretary.*

COMMITTEE ON SECRETARY'S ANNUAL REPORT.

The following gentlemen were appointed as a committee on the Secretary's report: H. Perley, Chas. Marsten, Abner Allen.

F. Wellhouse moved to deposit the medals and diplomas awarded the Society for displays of fruit, with the State Historical Society, as recommended in the Secretary's annual report, which motion was concurred in.

ELECTION OF VICE PRESIDENT TO THE MISSOURI VALLEY HORTICULTURAL SOCIETY.

E. P. Deihl moved that the Secretary be instructed to cast the ballot of the Society for Prof. E. Gale to fill said office, which was concurred in, and the ballot was so cast by the Secretary.

ELECTION OF OFFICERS FOR 1881.

President—Prof. E. Gale, Manhattan.

Vice President—M. B. Newman, Wyandotte.

Secretary—G. C. Brackett, Lawrence.

Treasurer—F. Wellhouse, Fairmount.

Trustees—C. H. Graham, Leroy; G. Y. Johnson, Lawrence; Dr. Chas. Williamson, Washington.

REPORT ON EXPERIMENTAL WORK FOR 1880.

BY H. E. VAN DEMAN, COMMITTEE.

It having pleased the Society to place me at the head of this department of its work, I cannot but feel thankful for the confidence thus placed in me of my ability to perform the work devolving upon the incumbent of such an office.

THE PEACH.

The peach has long been one of my favorite fruits. I have for years been trying to experiment with varieties, in my humble way, using such meager means as I could command. Any one endeavoring to find from experiment what is best suited to any locality, knows how tedious and expensive a work it is; and indeed, it is well that our State should help these feeble efforts to hunt out and determine what horticultural products are suited to her soil and climate. Such a work is eminently one for the *public benefit.* The little financial assistance in enabling me to procure buds and trees of new varieties, is something, and the kind and willing assistance of fellow-workers in this and other States, is more. I have not appealed to a single experimenter, including such men as Berkmans of Georgia, Munson of Texas, Engle of Pennsylvania, Barry of New York, and Murril of Arkansas, besides many of our own Kansas friends, who has even hesitated to render me all the encouragement and assistance possible. In many cases I have received buds and trees for the mere expense of mailing or expressage; in others, I have exchanged, and in some, purchased. It is impossible to keep entirely up with the times in securing all the new varieties, but I have the most of them.

In all cases, the funds have been expended only as above stated. This report includes the years 1879 and 1880:

August 19th, 1879—Received cash of Treasurer		$ 3 00
January 1st, 1880—Received cash of Treasurer		10 00
August to September, 1879—To postage and expressage	$3 00	
April to October, 1880—To postage and expressage	8 40	
	$11 40	$13 00
Balance on hand December 14, 1880		1 60

The outlook is quite encouraging. There are so many new kinds of peaches being produced, and fruit is so soon produced, that from the large list we may hope for something of value.

THE PLUM.

In the way of plums, we have been compelled, so far, to depend almost entirely upon wild seedlings, gathered from the woods. Intelligent experiments with seeds will no doubt follow. The list of native varieties is now quite good, and includes those both early and late. Texas and the Indian Territory have so far produced the finest varieties, excepting the Wild Goose, from Tennessee.

A revised list will be published and sent out next July.

Respectfully submitted. H. E. VAN DEMAN.

On motion, the report was approved.

Adjourned.

EVENING SESSION.

WEDNESDAY, December 15, 1880.

The Society assembled in joint session, at Alcott's Hall, with President Gale in the chair.

WANTS OF HORTICULTURE IN KANSAS.

BY DR. G. BOHRER, RAYMOND.

In order that I might be present at this, the fourteenth annual meeting of your organization, and witness your deliberations, I have been compelled to travel over two hundred miles; and in doing so I have not, I trust, been prompted by any motive of a selfish character, aside from that which is common among mankind, in all honorable pursuits. For in all organizations among men, of a meritorious character, the object of each individual is, or should be, to use his best endeavors to advance the interests of each member in common with his own. Something like this, I understand to be the object of this meeting and of this Society, as far as it lies within its province.

In looking over the proceedings of this Society, from its earliest existence to the present hour, I find that it has had many unsolved problems and vexed questions to deal with. Prominent among these, is the question as to whether Kansas can ever be made a fruit-growing country. In part, this question has been settled beyond all doubt. In this, the eastern portion of the State, where at one time doubt lingered, and where many persons planted fruit trees—simply it would seem, to witness their destruction, as additional proof of the then supposed fact that fruit trees would not live and prosper in Kansas—I say here, where all that I have alluded to transpired, we now see the finest fruit trees and the best-developed and richest-flavored fruits to be found in the civilized world. This I do not offer as simply a bare assertion, but in support of the statement I offer the following testimonial:

INTERNATIONAL EXHIBITION, 1876.
CERTIFICATE OF AWARD. STATE OF KANSAS.
Ninety-six varieties of Apples. No. 20. Group thirty-six.
United States Centennial Commission.
(In accordance with the Act of Congress,)
PHILADELPHIA, September 27, 1876.
[SEAL.]
A. T. GOSHORN, *Director General.*
JOSEPH R. HAWLEY, *President.*
JOHN L. CAMPBELL, *Secretary.*

This diploma was granted by the group judges, in the following language: "For an exceedingly fine exhibit of apples, esteemed the more valuable from the general absence of merely local, showy and worthless sorts."

But while success in this particular is no longer in doubt here, it still continues to be a question of doubtful propriety in many other portions of the State, whether we shall plant fruit trees. I live in Rice county, which is located in the exact center of the State; and in the spring of 1874 I set out apple trees, as did many others. In July following, nearly all were destroyed by grasshoppers. Since that disaster, when persons have seen me at work among my fruit trees, I have often been asked the following question, or something similar: "Does your mamma know you're out?" I say this or some similar question was put to me from time to time, until within the last three years I have been able to show an orchard of more than five hundred healthy and rapidly-growing apple trees, and the present season I had the pleasure of showing two well-developed apples. The tree upon which they grew was set out in April, 1877. This certainly shows no mean success. But to inspire the new-comer with a sufficient amount of confidence to induce him to prosecute vigorously the cultivation of fruit trees, in the new and for the most part unimproved regions of the State, is a task I find of no ordinary magnitude; at least it is so in my county, and I feel quite confident that you found it so here in years gone by.

During the last two seasons it has been somewhat difficult to get young trees to grow, owing to a lack of rainfall about planting-time. I had no trouble in this respect, as it was my custom to water my trees when I set them, and to keep them well watered until such times as a sufficient amount of rain fell to render it unnecessary. But here the lack of knowledge and vigilance again manifests itself among the masses who are uneducated in Kansas horticulture. The fact is too often overlooked, that in this State a scant amount of rainfall during March and April is the general rule, and an abundance the exception. This mistake being a common one among our new settlers, causes many of them to hastily reach the conclusion that fruit growing in Kansas cannot be made a success, and nothing short of actual demonstration, it seems, can remove this impression. In view, then, of this fact, it occurs to me that one of the most important duties devolving upon this Society is, to increase its annual amount of printed matter for distribution — the same to contain much of the experience of those who have worked their way to success; for I find persons miles away from me, since my partial success, making inquiry as to my method of preparing the soil, the distance I set trees from each other, the manner of cultivating, the kind of protection, and the kind of crop I cultivate among them. While information sought through this method of procedure is perhaps good enough as far as it extends, it is, as all must admit, a very slow method of reaching general success; hence the propriety and importance of putting into the hands of the interested reader, printed facts. In order to increase the ability of this Society to distribute more reading matter, the attention of our Legislature should be called to this and other matters of importance, and asked to be liberal in voting appropriations in support of the objects of this Society; for I am of the opinion that while our State is making many judicious appropriations in support of her industries, she can make none that will add more to her already world-wide reputation than to give her horticultural interest a generous support. I insist that such should be the case, not only for the reason already assigned, namely, that of enabling the new settler to go to work intelligently and in harmony with the requirements of the situation, but for the additional reason that it will to a great extent put a quietus upon the false rumors so commonly and so lavishly heralded among new settlers by that element in our midst, who are not here, it seems, for the purpose of doing any good for either themselves or for anybody else.

To give a better account of this class of animals and of what they are up to, please permit me to repeat some of their sayings. On my arrival in Kansas, if I was about to plant corn, they would say: "This is not a corn-producing country." If I was planting potatoes, they would say: "The bugs and drouth will get away with them." If I went out to sow turnip seed, they would say: "Insects will eat them." If I planted squash or pumpkin seeds, they would say: "They won't grow." If I succeeded in raising onions, they would quote from Josh Billings, and say: "They are bad for a good breath, or good for a bad breath." Not being able to state definitely which they answered best, they would, like Josh, insist that either way was right.

Now permit me to state, what observation will prove to be true, namely, that such people as the foregoing class never settle and develop any country; but on the contrary, they invariably prove themselves to be stumbling-blocks in the way of progress. There is no place upon this continent where the people of progressive inclinations have been more frequently misguided, and more sadly led astray by them, than have many of those who have come to this State in search of homes. Nearly, if not quite all, the old residents of

Kansas, I believe, will join me in the foregoing statements touching this floating and worthless element. I believe, too, that no one who is familiar with the fruit-growing interests of the State can for one moment doubt the propriety of placing in the hands of the reading immigrant printed facts touching the fruit-growing resources of our State.

If, however, there is a single person here this evening who has applied himself industriously to cultivating the apple, the pear, the cherry, the peach and the plum, in any part of Kansas for a term of five years, and is able to report anything short of reasonable success, I wish that person, while I pause, to rise up and give his name to the Secretary, and explain what his method of management has been. I do not believe that such a person can be found, provided he has prepared the soil, cultivated his trees and subjected them to that general system of management that has been recommended from time to time by persons who have been and still are members of this Society, or careful readers and students of its proceedings. I heard my friend George Y. Johnson read a paper on the apple and its cultivation, which, if carefully read and its teachings rigidly adhered to in practice, will result in successfully raising that fruit in almost any part of Kansas. I had in the main tested what he recommended, and consequently feel safe in supporting his views now. And I can most cordially say as much, and lend the same support to other papers on the cultivation of other fruits.

But the great difficulty is in getting these and other well-established facts into the hands of such persons as will reduce them to practice. It is, in fact, impossible to do so, unless a larger number of reports are printed. It is my opinion, however, that with the usual amount of the reports of the Society sent out annually, success will eventually spread over the entire State, but with much less rapidity than would result from an increased amount of printed matter.

I find that much of what we see and hear of in the way of failure, is due to not making a start in fruit growing in harmony with the requirements of the situation. This is often the case for the lack of proper information. When a first effort fails, in many cases the parties overtaken by disaster are fully prepared to heed the advice of the class already noticed, namely, that class of persons who want to go East and stay with "wife's folks;" but inasmuch as I have stated that disaster is in the main due to error in the outset, of starting a fruit orchard, let us consider for a moment what is almost sure to be attended with ruinous consequences in almost any part of Kansas.

To begin, let us note that man's progress who prepares his ground for the reception of trees by simply turning over the sod; then let us see how he becomes electrified when his eyes are made to gaze upon the over-colored and magnified illustrations found in the fruit-tree peddler's picture book. How the pupils of his eyes alternately dilate and contract as they take in the vast dimensions and the fine proportions of the different fruits he has with him, put up in bottles and jars that magnify them from a fourth to a third above their real size—a fact, by the way, which the tree man forgets to tell him. But soon the magnetic influence of these cuts and of the salesman's assuring words takes possession of him, and an order book is produced, and before he is fully aware of what has transpired, his signature is put to an order ranging from two dollars up to one hundred. He now arranges to have his money on hand to meet the delivery of trees, or finds some one who will join him in his note as security. Finally they arrive. He goes to the place of delivery with all possible speed. In some instances, however, he recovers from the electric shock produced by the peddler and his colored plates, and does not go to the place of delivery until he is notified that he had best call for his trees and arrange to pay for them, as a failure in this particular will cause a little suit at law to be instituted. He finally concludes to take the trees, and possibly they are in good condition, but most commonly they are not as fine trees as he contracted for. Aside from this, a large share of them have been roughly handled, the bark being broken here and there; some of the limbs are split off at the body of the tree, leaving a ghastly wound, from which the tree not unfrequently fails to recover. But in case the foregoing state of affairs does not exist, the trees have perhaps been exposed to the open air until the branches are not only wilted, but are positively shrunken, and the trees to a practiced eye present a melancholy spectacle, and are unfit to set out. Possibly all of these defects may not obtain, but the purchaser may have committed the error of ordering four or five-year-old trees, in order, as he has been told, that he may have a bearing orchard one or two years sooner than if two or three-year-old trees had been selected. He overlooks the fact that four or five-year-old trees very seldom are shipped with roots that correspond with the body and top, and that on this account they are almost sure to make very slow progress in growing for the first three or four years, or, as is not unfrequently the case, they perish the second or third year after they have been set out in the orchard. But with some of the foregoing defects present, he sets out his orchard on the ground already described, and in holes ranging in dimensions all the way from eight inches square to eighteen. Usually he does not water his trees as he sets them out, nor does he wrap them with straw or grass, as a means of protection against sun-scald, rabbits or hail storms, but trusts to luck. It will be proper to add that he has set his trees in rows eighteen or twenty feet apart each way, for this is to become a factor of no minor importance in the course of time. He has set out no sort of forest or fruit trees as a means of protection against wind from the east, west, north or south; he leaves his orchard for a term of weeks to do the best the situation will admit of. After awhile he returns, hoping to find them doing first class, and in a majority of cases a melancholy spectacle meets his gaze; perhaps nine out of ten have failed to start—are stone dead. Or it may be that he has set them in the fall, and having neglected to wrap them, the rabbits have taken a winter's supply of food from them. In either event, the few that are left unmolested and are in a growing condition, are usually neglected, and in two or three seasons close out their existence. Then Kansas is charged up with the failure, on account of being infested with rabbits. Or if all his trees live for a time, they finally die of sun-scald, there being no wind-break or wrapping on their bodies to prevent such a disaster. Kansas at once gets a bad name as a fruit-growing country.

But suppose that the trees are in proper condition, have been well set out, and well cultivated, pruned and protected for a term of twenty years, and have made a successful and satisfactory growth, having been set eighteen or twenty feet apart each way in the row. The owner finds it necessary to go through his orchard with a team and wagon, but cannot do so, for the reason that the limbs have met and lapped themselves together to such an extent that he can scarcely get through himself without stopping. Here it will be seen that new troubles appear, through the supposition that apple trees will not grow large in Kansas. This is a mistake, and is beginning to make itself manifest in some of the oldest orchards of the State. This is an error that cannot be corrected without being attended with loss, in all cases where the trees have been set eighteen to twenty feet apart. It will also be seen, that to set them either sixteen or thirty-two feet apart each way is the better plan; for when set sixteen feet apart each way, every alternate row can be removed as soon as they begin to interfere with each other. Here, then, is another problem, which among the oldest and most experienced fruit growers of the State needs no further investigation, but needs extensive publication among the settlers of the unimproved portions of the State.

But having perhaps discussed the common causes of failure, in the preparation of the soil, purchase of trees, planting and cultivating them, to a sufficient extent to be understood, let us look for a moment more at the matter of general protection, in the shape of wind-breaks.

It has, I believe, been generally conceded by all who have expressed themselves before this Society, that the cultivation of trees of some description or other, as wind-breaks, is a matter which should by no means be neglected. The statement has been made, without contradiction, that with the plow, the tendency among mankind is to drive a country into a desert; and I am well convinced that in the absence of trees along many of the section and half-section lines of this State, we will, in a brief period of time, prove Kansas to be no exception to this rule. This fact, I deem of vital importance to impress upon the minds of the masses, as it affects the horticultural and agricultural interests of the State to an unlimited extent. When we come to the selection of trees to plant for this purpose, there is a diversity of opinion — one being in favor of the cottonwood, another the black walnut, another the box elder, and so on through the entire catalogue of trees. I have been taken to task for recommending the cherry as a roadside tree. The principal objection that I have heard urged against it is, that it will require an immense amount of trees to reach along all our public highways. Just as though it would require any more of them than of any other kind of trees. A second objection is, that they will sprout, and consequently look badly. In reply to this objection, I say let them sprout and grow up as thick as they can stand, as they will in that event make a better wind-break; besides, they will not fall across the roads and kill travelers and their teams, nor will they fall into growing crops, nor shade them to death. But every other tree yet named before this Society, and recommended for this purpose, excepting the box elder, will be guilty of all these bad tricks. Another most singular objection was urged, namely, that our people are not educated up to such a standard as this thing of planting cherry trees along the public highways. Notwithstanding this view of the case, it does occur to me that we all understand quite as well how to set out a cherry tree as any other kind of a tree. Again, it was urged that so many trees loaded with cherries, would be such a strong temptation to our boys that they would steal them. The real facts in the case are, that the reverse would be the result. But lastly, it was urged that owing to the enormous expense of producing the trees, the subject was of such stupendous magnitude that I had most surely failed to comprehend it; while the facts in the case are, that the trees can be produced quite as cheaply as many other kinds, and that the gentlemen opposing me were so completely surprised at the new idea I had introduced in Kansas horticulture, that they determined to make a raid upon it, without stopping to comprehend the magnitude of what I did say or recommend. I am well aware that there are some localities and situations where the cherry tree would not prosper as a roadside tree; and in such situations I would advise the use of the next-best tree, but would, as far as possible, avoid planting trees at the roadside which would grow to be large, for reasons already advanced.

In the selection of forest trees for cultivation in any situation, there appears to be some difference of opinion as to which are the least liable to injury from insects. I believe all agree that every tree has its enemies, and that the black walnut sustains as little injury from the attacks of insects as any other, and perhaps less; but I am well convinced that the more trees we have, the more birds we will have, and that trees generally will suffer under such circumstances so little, that this part of the subject will in time command next to no attention. Therefore, let us plant trees that are known to be valuable in the Mississippi valley, without consuming much time in discussing the question as to whether or not we are in time likely to lose one through the ravages of insects.

I am certain, that along the line of the Atchison, Topeka & Santa Fé Railway, as far as Larned, where that railway company have planted trees of different kinds, such as the box elder, red maple, black walnut, and some other varieties, they are making rapid growths. I am not going to become in the least alarmed at seeing occasionally a tree attacked, and perhaps destroyed, by an enemy. But, by all means, let us not prove ourselves to be the most destructive enemies we have to contend with, through neglect in cultivating, or giving them all the care that their nature demands. Of course, I would not have the impression go abroad that no account is to be taken of the ravages of insects; but let us destroy them by every available means, and, at the same time, plant any tree that is valuable.

As birds are known to be deadly enemies to insects, and thereby prove themselves to be the friends of trees, let us encourage them. Let us be sure to drive every scamp from our farms who attempts to injure one, except it be a hawk or a wild goose. It is true that the hawk will destroy an occasional gopher, but for every one that he catches, he will charge you up with ten birds, and collect his pay. I know of no other bird who charges such extortionate rates for the little good he does; in fact, I look upon him as being outrageous in his charges, and consequently intolerable. But to all others with whose habits I am familiar I give an invitation to come and stay with me, and make themselves at home. I see by one of our reports that some one who has met with this Society is unfriendly to the quail, and calls him, in substance, mischievous. I have lived in a quail country all my life, and have not found him to be a criminal, and feel confident that there is some mistake about the charges that are urged against him. To cut this part of the subject short, I believe it to be the duty of this Society to sit down upon all manner of warfare against birds generally, and to teach everybody that they are our friends.

But to look farther after the wants of horticulture in Kansas: I have already stated that at one time the pursuit of fruit growing in this part of the State was by many regarded as a bad investment; that through dogged perseverance, the threatening clouds of disaster have been lifted and driven away, and that a clear and silvery sky is now over you — a golden sunshine about you, and a rich treasure of fruit is from year to year being gathered by you. With us in the southwest, however, the situation to-day is, as I have stated, different from yours. There the light of success is beginning to dawn in a few cases only. I have told you of my own experience — of my efforts, of my failures, and of my final success in fruit-tree growing. There are a few others who have, through untiring vigilance, kept pace with me, and who, if they were here to-night, would with their testimony verify my statements; and, although we feel that our hands have reached the capstone of success, and that soon we shall mount to the summit, there are many others who it seems stubbornly refuse to believe that fruits will ever grow in central and western Kansas. To remedy this hindering weakness among those of our people who would be energetic in tree culture if they could be inspired with confidence, permit me to repeat that the State Legislature should come to the rescue with additional aid to this Society. A constant and increasing demand is pressing you for printed facts. Do not refuse to lend the aid so earnestly asked for.

I have stated on a former occasion, that to insure the highest degree of success in fruit and field-crop culture, we must have trees as a means of protection, for without it, many of our people will continue to be dependent through a want of success. To point out the difference between a farm, orchard and kitchen garden that is not protected by trees, and one that is, let everyone interested investigate for himself, and it will quickly be demonstrated that while in the first crops of every kind are poorly developed, in the second they will be found reaching the highest degree of perfection known in the vegetable kingdom. It is in these protected situations that the ornamental work of cultivating flowers is being successfully conducted by the pioneer ladies of the State. They who have stood by the yeomanry of the country through the darkest hours upon record in our State's history, who have suffered such great privations, and endured them with such wonderful patience and fortitude as amounts to nothing short of heroism, are converting these homes into earthly paradises. God bless the pioneer women of Kansas! In every great enterprise of the State bearing upon the intellectual and moral ornamentation of society they have always been prominent. And in horticulture I see they are equally energetic; and in my opinion they are right in wishing horticulture taught in our common schools. I say "they" in this case, because I know that some of them are in favor of this measure.

I conclusion, I will ask all to consider my suggestions candidly. I do believe that if what I have suggested is put into practice throughout the State in connection with the special teachings from time to time by the different members of the Society upon special subjects, triumphant success will follow, and that coming generations will pronounce blessings upon this Society's efforts.

THE PHYSIOLOGICAL AND PSYCHOLOGICAL MISSION OF HORTICULTURE.

A LECTURE BY JAS. MARVIN, D. D., CHANCELLOR KANSAS STATE UNIVERSITY.

"Strength may wield the ponderous spade,
May turn the clod, and wheel the compost home,
But elegance, chief grace the garden shows,
And most attractive, is the fair result
Of thought, the creature of a polished mind."—[*Cowper*.

Horticulture, to the man of literary turn, appears as a compound of two Latin roots—*hortus*, signifying a garden, and *cultura*, culture. Our prosaic Saxon calls the process *gardening*, from German *garten*, Anglo-Saxon *geard*, English *yard*. Webster says a garden is a piece of ground appropriated to the cultivation of herbs or plants, fruits, flowers and vegetables; a rich, well-cultivated spot or tract of country; a delightful spot. The popular notion restricts the garden to the place for cabbage and cucumbers, and applies horticulture to the cultivation of house plants and flowers in the front yard. Agriculture, to these definers, means wheat, corn, cattle, and furnishes an arena for men; while women cherish the tenderer plants and ornament with bouquets the parlors and doorways. These false notions disappear as frontier life recedes and age peoples a country with generations living in permanent homes. Horticulture then becomes a fine art, as well as a sure indication of comfort or even of luxury. Men find employment worthy of all their strength and skill.

HISTORY.

The history of horticulture fills some wonderful pages of the past; descriptions of its achievements are life-like pictures of people once rich and powerful, now known only for what they were—such is the story of Babylon and her terraced walls and hanging gardens. To-day the vast wastes between the Tigris and Euphrates present but feeble traces of the wonderful fertility of that continuous garden, irrigated from the waters of two confluent rivers, fed from the mountains of Syria and the slopes of the Himalayas. This valley for more than a thousand years fed a population at home equal to the most densely populated portions of Europe to-day, and much of the time kept in the field the largest armies the world has ever seen. What a picture of fertility and beauty the valleys of Sharon and Esdræbon must have presented in the time of Solomon! The banks of the Tiber, and far out along the Appian Way, the richest fruitage, the finest verdure and most charming flora-covered fields, cultivated to their highest capabilities, until the vandal heel of Alaric and his barbarous hordes trampled them to dust. The march of civilization has been marked by this art of utilizing the soil and the sunlight, and converting them into food for the stomach and beauty for the soul of man. No sooner had Charlemagne secured control of his home domain, than he began to develop French gardening. His system commenced in the eighth century, and has been perfected through succeeding ages, and "beautiful France" with "her vine-clad hills" and "her floral vales" has been woven into the imagery of poetry and painting until the world knows them by heart. During the troublous times in the fifteenth and sixteenth centuries, the monasteries carried gardening to a high degree of perfection.

Henry IV, of France, as a monument of his reign, established the famous botanical gardens of Montpellier. England has devoted herself largely to parks and lawns from an early period in her history. The cool, damp climate, with friable soil, is well adapted to this kind of culture. Conservatories were not used until 1717, and from that time the garden flora of the tropics have beautified the hot-houses of the British Isles, and bloomed under the skies of Russia and Norway.

Gardening, for profit or pleasure, secures the best results when the labor and skill are bestowed upon vegetables adapted to the soil and climate. No exotics equal in beauty and richness the native verdure of the English and the Scotch parks. Nearly all of western Europe is a continuous garden, from the Zuyder Zee to the Pyrennees, and from the Swiss Alps to the English channel. To this region, with 200 to 300 people to the square mile, gardening becomes a necessity. In the United States, too much unoccupied land tempts the cultivator. He ignores the spade, and longs for the steam plow. In this country there are multitudes of people (native-born) who have never seen any real gardening. Our oldest cities have just awakened to the importance of public parks. Thirty years ago the middle and upper part of Manhattan Island was a barren, rocky heath, a place for worn-out dray-horses from New York city to be turned out to die. First, the Croton reservoir, located near the center of this desolate tract, made its irrigation possible. Now, about 850 acres of this once worthless common has been transformed into the pride of our greatest American city. Ten miles of the finest carriage roads, twenty miles of gravel walks, twenty acres of miniature lakes, numerous cascades, fountains sending their sparkling spray into the sunbeams, forest trees from the stately elm to the mountain fir, cast their shadows over lawns of the softest verdure, or on half-hidden rockeries where art thinly conceals Nature's original nakedness. Instead of wild dogs, skeleton horses, and the omnivorous crow, tens of thousands of citizens and strangers daily walk, drive, sit, and feast body and soul amid the charms of this wonder of the gardener's art—New York's, yes, the Nation's, Central Park. Go with me on a July afternoon from the mingled odors of Fulton Market up to Broadway, thence through the crowds of that thoroughfare to City Hall, and then out on the Fourth avenue cars to Central Park. There, instead of the stinted breath of fetid odors, take a full inspiration from fresh, pure air that comes to your cheeks with kisses from the lawns and leaves, and opening flowers and laughing waters on every side of us. Take a rustic seat near a waterfall or fountain. See the children out with their nurses—how delighted they are with this free air! The languid invalid, the poor victim of fashionable society, and the care-worn accountant, whose brain reels at the thought of endless columns on the ledger page and balance sheet—how they all revive under this balmy freshness! Of all the sanitary appliances of that great city, none equals the water supply from the Croton river through the Central Park reservoirs. And next to this is Central Park itself. The breezes from the Sound and the great bay soon lose their sweetness in the tangled mazes of the lower city. Fetid breaths from countless thousands of animal lungs, and fires and stews, and roastings and mingled filths load the whole atmosphere, which bears up the long avenues the invisible freight, drifting it into every open apartment on the way. Every growing plant, every dewy lawn, every sparkling fountain takes off a part of this load of impurity. The great park itself is a most wonderful laboratory, where under the sunlight and the frequent showers the carbonaceous gases are converted into tree and shrub, and lawn and flower, where millions of open mouths are ready to absorb and change to forms of beauty the unseen noxious vapors, and leave a purified atmosphere to revitalize the human tide. Advertised as a pleasure ground, as an ornament to the city, as a display of art—more than all these, Central Park is a great sanitarium.

Other American cities are following this plan for furnishing pleasure resorts, either within the city proper, or on the confines, and secure the double advantage of adornment and health.

CEMETERIES.

Churchyards as of old are no longer tolerated. Spacious groves, once sought as the homes of the gods, are now selected with care, and prepared with artistic skill, for the last resting-places of our mortality. Here flowers bloom over the graves of loved ones; affections are cherished, and we call the care bestowed, regard for the dead. An expression better fitting the results would be, a practical prayer for life to the living.

OPEN COURTS AND CITY STREETS.

Western towns and cities have changed the old-time usages. Wide streets lined with trees from the forests, spacious fronts embowered with flowering vines, and open courts where sparkling fountains play with the sunbeams, are not the exclusive property of a select nobility. The Forest City opens out her private parks to the public eye; even the iron palings disappear. The fresh winds from the lakes, the showers and the sunshine, conspire to quicken the growth and beautify the verdure of what man has planted for ornament. The young city on the sand downs of Lake Erie wears the wreath of honor. There is but one Euclid avenue in America. But of how little moment is all this wealth of beauty, compared with the far greater wealth in health and happiness that comes to all classes of people who inhabit these cities in the woods. Contrast their situation with the denizens of the lower wards, shut in by narrow alleys, confined within walls rising one story upon another, as if to utilize room skyward for want of surface, and yet trespassing upon the lower regions as if fearful of the upper air. Pestiferous breaths flow from all these haunts of strange companionship of poverty and avarice. Every city park, every private garden, every ornamented street, every fruitful orchard, and every well-cultivated field, is in its growth a purifier of the atmosphere, a friend to the life forces of the human family; they add to the length and energy of human life.

FRUITS OF THE GARDEN.

We have thus far presented the mission of horticulture in transforming the landscape and purifying the atmosphere. These are really incidental advantages. Man as a rule provides first for his stomach, and then feasts his eyes and scents the fresh breezes. When hungry he can eat where he would be ill-content to live. Even to the hungry, however, good clean food in a clean place is more than doubly palatable; and when the food is nature's own product under the guiding hand of one's own industry, how sweet to the taste! By common consent, the gardener's art has given us more wholesome luxuries for the table than all the cook-books of the world. The triumphs of skill and care in breeding choice animals is wonderful. The short-horn Durham and the beautiful Devon are a wonderful advance on the little scrubby Gallic bovine of Cæsar's time or upon the bison or Texas steer of our time. No greater than the improvement which gives us the Percherons, the Messengers and the Morgans of this time, instead of the dwarfish horses of Brittany or of the vicious Indian pony of America. The same kind of skill and care that has secured these improvements and others like them in the line of domestic animals, has transformed our fruits from bitter, acrid, unpalatable wild growths of the wooded hills to the luscious peach, pear and apple of the orchardist to-day. Our delicious small fruit and garden vegetables have been developed under like circumstances. They are being developed not by accident, but by the most assiduous care and painstaking skill. To produce for the market requires peculiar qualities to fit the season, the transportation, the soil and climate where raised. A variety of products must also be studied, so as to keep the highly-cultivated soil under proper subjection, as well as to supply a constant market demand. In raising fine stock, horses, cattle, sheep, etc., every observer knows the necessity for care in keeping a choice variety up to the standard. The animals show any neglect very quickly, and a single generation of bad breeding ruins the stock. So in the production of choice vegetable and fruits. Weeds and scrubby trees have wonderful reproductive powers. The persistence with which they claim the soil is wonderful. Seeds from many common weeds will lie dormant from year to year, waiting for the favorable conditions for growth. The gardener's neglect gives them opportunity. The most valuable varieties of fruits are often unreliable reproducers. We say they are not hardy; do not readily accommodate themselves to changes of soil, climate and modes of cultivation, or that seedlings from them are degenerate. To improve upon good varieties, requires patient experiment, often through a series of years. This is especially true of the long-lived and slow-growing kinds of orchard fruits. How generally this fact is overlooked by the purchasers of nursery stock; how few think of the years of waiting for a Bellflower, or an Amsden, or a Bartlett, and how many thousands of inferior or worthless seedlings were consigned to the flames before they were brought out. Furnish a table with the finest fruits of the season, in midsummer or autumn. Let there be grapes, apples, peaches, pears, quinces, plums, from the vineyard and orchard; let there be the usual variety from the kitchen garden. To these, in all their varieties of size, form, color and delectable flavor, add the odor of heliotrope, as it floats on the air from the rich bouquets of flowers, arranged by the housewife's skill, and then count the cost of bringing to perfection any and all of these valuable products.

RELATION BETWEEN ANIMALS AND VEGETABLES.

A natural balance exists between animal and vegetable life. Many a sickly denizen of the city has found to his joy, the utility of "country air" and "country diet." We have said that Central Park was a sanitarium—so is every orchard and well-cultivated garden, and field of growing grain, and expanse of meadow, every forest in the valley or on the mountain ranges. What animals exhale the plants inhale. The wasted tissue sent out unseen from animal lungs, is taken up by leaves and blades and transformed into vegetable tissue and flower and fruit. So the never-ending round of changes, responding to the laws of demand and supply, goes on. Reciprocity is God's law in nature. The healthy growth of one living system requires the presence of the other living system. Under the royal favors of the king of day, each in the other enjoys blissful company. How the vegetable might succeed without the animal, we must leave for the scientific imagination to devise. We know that most animals attempting to live without the vegetable, only exist in a sorry condition—hence the constant demand for the gardener and the profit of his labor; the very dust he handles in cultivation, becomes his friend. It removes offensive odors, absorbs noxious miasmas, and saves him from numerous unseen though deadly foes.

We conclude, then, that one important mission of horticulture is to furnish healthful food and employment to man. Both of these considerations furnish the basis for showing why the business of the gardener is profitable. Like any other lawful business, the rules of economy apply: industry, skill, energy, frugality, all enter as factors in determining the result of labor. A man cannot set a lot of young fruit trees in holes dug in a clay bank, and properly expect a fair crop of fruit in five or six years. With labor enough in preparation, the clay bank might be converted into a fruitful orchard, a garden of beauty. Persistent labor will transform the barren heaths into fertile fields. Nature with her forces mightily helps the man who invokes her aid. We have seen this demonstrated in the wonderful changes effected, not in soil alone, but in climate. Rocky barrens, like Central Park; marshy wastes, like the coasts of Holland; rainless regions, like the valley of the Nile, have all been subdued and made productive under a combination of natural and human agencies. Without the latter, Manhattan Island would have furnished scanty food for a flock of goats; the Zuyder Zee would have settled through the salt marshes to the North Sea; and the hippopotamus had held the slimy banks of the Nile.

MATERIAL INTERESTS.

Nearly related to the physiological is the financial phase of this question. Men seldom prosecute any calling for the sake of promoting health, either personal or general. A sick man will follow almost any prescription that promises him restoration to health. He is no sooner well, than his anxiety turns, first, to what he shall eat, and next, to how he shall make money. Visit the thoroughfares of any large city on a bright May morning. Ask how these vast throngs shall be fed. Go to the markets; observe the stalls, the wagons, the railroad cars laden with produce from the country; see the vessels at the wharves discharging their cargoes from the tropics;—and then wonder what is to become of this mass of cabbages, turnips, potatoes, onions, melons, oranges, bananas, apples, cherries, and all the rest of this endless array of fruits and fishes and fowls, and every other thing to supply a hungry palate, or to decorate a dinner table. In a few hours, the "basket brigade" have cleared the way; a few straggling foragers are picking up the leavings. The labor and care of thousands of busy hands are rewarded in the distribution from the sales of this one market morning. Multiply this by the days of the year and the cities of a continent, and we begin to see what gardening means in a financial way. Sections of country remote from markets are brought nigh by steam navigation and railroad facilities; perishable products in coolers or in cans, or dried by the Alden process, find their way over thousands of miles, to hungry mouths. The extremes of the whole country are brought together: Chicago picks its March strawberries in southern Texas, and New Orleans takes its ice cream and raspberries in August fresh from Maine or Minnesota. Kansas occupies a large part of the middle ground between East and West, between North and South. Her choice of markets is most favorable. The whole range of the golden belt from northwest to southwest is at her disposal. Many of the more substantial fruits, staple here, are out of their climatic range in the States north and south of us. Minnesota and a large part of Nebraska cannot rely upon peaches and apricots, and cannot compete for any of the earlier products of the orchard, or field, or garden. Snow covers the country when our orchards are in full bloom. Texas and a large part of the Indian Territory are too far south to produce palatable apples, potatoes, and other fruits and vegetables which grow to perfection under our skies. No producing field lies between us and the mountain ranges. We can furnish the North with fresh vegetables earlier than their own products mature, and the South may regale herself on our ice-head lettuce long after her home supply has withered under her scorching suns. Through lines of road to the Atlantic open the Eastern markets to fair competition with the older States. Gardening for profit, then, cannot fail in Kansas. The horticulturist, in addition to his home supply, has the promise of rich returns of a large surplus.

PSYCHOLOGICAL VIEW OF THE QUESTION.

We have already anticipated in part this phase of our subject. He who deals with nature's laws and forces must think—no mindless dullard has any satisfaction or security in this domain. Every step in the horticulturist's path leads on and up in the study of nature. His observation quickens his ability to perceive. He sees as by instinct operations in nature's laboratories, hidden from the unpracticed eye. Common minds attribute to accident or to some mysterious cause what he sees and knows to be the legitimate result of fixed laws. He avails himself of this knowledge, and hastens to furnish our tables with the most delicious fruits and to ornament them with the most delicate flowers, all originally from an indifferent parentage. The common observer sees only sterility in a rough and rocky bluff. The gardener prepares for a vineyard on the hillside. He woos the sunshine and showers. The luscious grapes, peaches and nectarines reflect in their beauty his smiles of satisfaction. An ignoramus may follow some thinking man's direction and raise a goodly tree, but he cannot have a tithe of the enjoyment from it which the man of knowledge receives. To one person all there is in a garden is its possibilities to produce money. All the labor, and care, and waiting look to that end. To such a one the labor is drudgery; the care and waiting are vexatious. They are endured only as a necessary means to an end. On the other hand, the intelligent horticulturist has a constant source of satisfaction in his labor. True, there are disagreeable genuflections in the setting of plants and trees, and he feels the frosts that nip the tender buds, but on the whole, he has far more joy than grief in the every-day duties of his calling. Newly-discovered truths have a luster brighter than the distant coin that may finally come as an added reward. How the healthy growth of a tree, the perfection of a superior fruit, the successful harvest of a crop, all under his own direction, feast the soul of such a man! He finds far more congenial associates in his own fields than at the street corners or in saloons with stale perfumes. More, he is a better man, a benefactor among men, for his devotion to his vocation.

Horticulture invites research at every turn. No other business rewards intelligent industry more surely nor punishes laziness more severely than gardening. As a means for improving good taste, gardening has long been recognized. The requisite study and practice go hand in hand. One cannot delight in an ill-assorted, ill-arranged growth of shrubbery, and be a true gardener; neither can one study carefully the coöperating forces of nature in plant life and growth without becoming alive to the far-reaching laws that control the universe. He who knows well what belongs to his garden, and the laws that govern its growth, lives in a larger world than most men have ever explored. I cannot see how any man can heartily and intelligently enter this field without coming face to face with his Creator. Lessons of the highest morality are drawn from the fields, the flowers, the fruits. The barren fig tree, the broken wall, the fruitful vine, the wheat and the tares furnished pointed texts for sermons, from Him who "spake as never man spake." A bad horticulturist is bad in spite of his calling—is a very degenerate man. We must conclude that psychologically the true mission of horticulture is, to quicken human perceptions, widen the scope of general knowledge, invite research, improve taste, promote morality, and bring man into harmonious coöperation with all that is highest and noblest in human pursuits. If these lessons are rightly learned, they are well calculated to lead to that higher knowledge of man's relations to God, the source of all truth.

On motion, an earnest vote of thanks was tendered the Chancellor for his able lecture, and a copy requested for publication with the proceedings of the meeting.

Chancellor Marvin: I feel grateful for your kind expression, and desire to be esteemed as one of your number, as I am at home, in the Douglas County Horticultural Society.

ANNUAL ADDRESS.

BY PRESIDENT E. GALE, MANHATTAN.

Ladies and Gentlemen, Members of the State Horticultural Society of Kansas: As we gather here to-night, let us gratefully recognize the sparing hand of the good Father, and turn our thoughts with child-like trust to the Giver of all good. We shall live our allotted years to little purpose if we do not find in the flowers, fruits and trees of earth some stirring reminders of the richer fruits and lovelier trees that bend with their luscious burdens by the banks of the river of life. It is this consciousness of a future, this linking of the bustling, pushing, toiling present with the great beyond, that gives grandeur to life. And with a trustful recognition of man's destiny, we are led to believe that the good and the beautiful of earth do serve to fit man for the higher state yet to come.

We meet here upon our eastern borders, to exchange friendly congratulations with our horticultural neighbors over the line. We come to shake hands over any past differences, and with friendly greetings to bid our neighbors of the great and noble State of Missouri God-speed in our common horticultural work. We wish here to-night to recognize the fact that our sister State has a host of honored workers in the cause of horticulture whose reputations are world-wide. We rejoice to know that State lines do not bind in such men as Major Z. S. Ragan, J. C. Evans, L. A. Goodman, N. J. Colman, Geo. Husman, C. W. Murtfeldt, A. P. Bennett, H. M. Vale, W. E. McBride, N. M. Hopkins, J. M. Slocomb, Wm. Mustard, N. C. Gano, Daniel Carpenter, S. H. Hardwiche, and James A. Bayles. They belong not to any one State, but to the world, and horticulturists everywhere delight to do them honor. Their work is our work, and their aims are ours. And we hold our annual councils to further a common cause. The pursuits ranked under the common name of horticulture have always been highly esteemed by cultured communities. Men of keen sensibilities and of the purer and nobler type have, in all ages, reverently worshipped God in flowers, and lovingly acknowledged His hand in the ripened and gathered fruits of autumn. The harvest of beauty in spring and the harvest of wealth in the autumn have been, in the minds of good men in every age, God's harvest. Man has gazed upon the reviving beauty of spring and read in nature's book the promise of a coming and better life for his own decaying nature. How prodigal is nature of her beauties! What a wonder of wonders in the ever-changing face of earth! Move where you please, over hill and dale, and new beauties burst constantly on the vision. Walk beside purling streams, and through quiet meadows where the bobolink and the lark sing to their mates; wander through the leafy woods murmuring the praises of the Infinite; wind your way up the rugged hillsides; climb the mountain-peaks until in the midst of the broken sea of mountains piled on mountains you feel that you stand alone with God; and then tell me, is there not much to love and cherish in nature?

No wonder, then, that man loves nature. Strange it is that man may live sometimes in the midst of all this beauty and yet not feel its power! In the mad chase for gain, men may sometimes forget and let pass unheeded the very presence of the infinite Father, as seen and heard in all nature around us. It is this conviction of an infinite Presence veiling Himself with the beauty and perfection of earth that gives such a ceaseless charm to the study of nature.

All the various departments of horticulture bring men at every step face to face with questions involving the power and wisdom and love of the Infinite. Not an opening flower, not a ripening seed anywhere, not even a budding leaf, but what is wrapped around with mysteries that a lifetime will not reveal. In the wonderful and quiet transformations of vegetable life we see the exercise of a power that is infinitely beyond man. Well may we bow with reverential awe before that power that from the simple vegetable cell builds up this vast vegetable world, and founds thereon the higher kingdom of animal life. If I were called upon to prove from nature the evidence of a design — and hence a designer — it seems to me that I would go back to the simple cell, and trace it up step by step, until I could bring my auditors to look out upon just this world of beauty of organized life which we have. None of our reverence is lost, nor does our interest flag, when we come to study the peculiar climatic conditions that govern organized life on this earth. And to us as horticulturists this is really one of the most practical questions of the day. We find ourselves forced by circumstances to take into consideration great meteorological questions involving the future of the western half of our State. And the question at once arises, how can we best promote the interests of that vast region? To this subject let us direct our attention.

First of all, we shall take the ground that in no case should we ignore established facts. In taking a brief review of this subject, these questions present themselves: *What do we find? What is needed? What can be done?*

In answer to the first question, we find a vast region fitly named the treeless plains, not that it is entirely destitute of timber, but trees are found only where they have been protected from the annual fires. We find here as deep and fertile a soil as can be found probably on the continent, a soil capable of enduring longer and severer drouths without ruin to vegetation than any other part of the United States. We find this whole region peculiarly subject to great irregularity as well as a low annual average of rainfall, and as a rule characterized everywhere by a prevailing lack of atmospheric humidity; and as a consequence of this the most marked extremes occur between the prevailing temperature of the day and the night. We should not fail to add that the altitude is continually increasing as we move toward the west. Remembering, then, the peculiar geographical position of this vast region, we have here stated the essential elements of a most important horticultural problem. Let us repeat those elements, as follows: Geographical position, altitude, atmospheric humidity, average and seasonableness of rainfall, extremes of daily and annual temperature, and prevailing winds. Every Kansan knows that the climate of the entire State has been characterized by no inconsiderable irregularity since its earliest settlement, and that the greatest embarrassments of the horticulturist has always arisen from the extremes of temperature and of moisture. If we may believe the testimony of the wood growth, we find that this same irregularity has marked the climate of this region for the last 150 years, and that there have been periods of drouth and disaster, and also periods of remarkable fertility before the advent of the white man—periods which have rivaled even the most productive years of late, almost reaching tropical luxuriance—and periods, too, when either drouth or locust spread desolation not unlike what we remember of 1874. Such is the testimony of the forests. And as the geologist reads the history of the earth in the rocks, it is the privilege of the horticulturist to read the history of the vegetable growth, and consequently of climate, in the records of the forests. And as men do not feel it safe or wise to ignore the testimony of the rocks, so it will not always be regarded as either wise or safe to ignore the testimony of the forests. The fact will sometime be more generally acknowledged than at present, that vegetable life receives an imprint of the climatic conditions through which it passes in its growth. Each circling season leaves its impress on the forests, which in due time, "he that runs may read." Men of large experience in other matters will tell us sometimes that we can only guess at what has been. They will tramp over the forests and yet learn no lessons from the wrinkles which age has put on the brow of the sturdy old oaks. But the horticulturist will glean a lesson from these silent old denizens of the forest—lessons, too, which if acted upon will save us many a trial and bring us many a success.

Now, as horticulturists, it will be only an act of wisdom to accept the lesson that may be gathered from our own department of nature. In regard to Kansas, and probably the entire Missouri valley, this lesson will be of vast moment. While we know that our climate for the past twenty-five years has been to a marked degree irregular, we are taught that this is not exceptional, but has characterized this region for more than a century at least; and to counteract the effects of climate is now and ever will be the most important and difficult work of the horticulturist. It is perhaps true, that it will be regarded as rank heresy by some, to even suggest difficulties in the way of fruit and forest culture, but justice to ourselves and to the inhabitants of the State, demand that we recognize the situation and seek to provide suitable remedies.

We need, then, to seek for the means to counteract the effects of these marked irregularities of temperature, and moisture and wind. The mechanical effects of the wind are often very injurious, but the influence of the wind currents upon vegetation indirectly is far more to be dreaded. It will be found that wind currents have a very great control over the temperature and moisture of the air near the earth's surface. If we can provide means to control the motion of the atmosphere, within say forty or fifty feet of the surface of the earth, we shall to a large degree control both atmospheric moisture and temperature just where it is essential to plant growth—that is, in the immediate vicinity of the earth's surface. Let it not be inferred, however, that we hope by any means within the power of man, to effect a great climatic revolution; for as a climate of any country results from geological, and even cosmic causes, so only through these can we anticipate great changes. And yet man's work on a far humbler field and lower plane, does seem sometimes almost tó amount to a revolution. It is with the immediate surface of the earth that he can work, and only in a local way. He may check the winds for a few feet above the earth's surface; he may open the soil so that it may receive more of the falling rain; he may retain the vegetable covering which nature gives, thereby effecting the double purpose of checking evaporation, and encouraging dew and rainfall; he may even hope to equalize and moderate, if not really increase the annual rainfall. Now, what can be done?

The idea has been urged very persistently of late that tree culture can accomplish very little in the development of the Western plains. On the one side we meet a class of enthusiasts, who tell us that all we have to do is, to plow up the plains, break up the dry, crusty soil, and the rains will be sure to follow the plow. They point back to 1860—that period of drouth and disaster—and then to 1869 and 1878, when the grateful earth so bountifully rewarded the labor of man. Surely, has there not been a great change? And what has done it except cultivation? On the other hand, we are assured that the laws controlling the rainfall of the plains are as irrevocable as fate; that the danger line vibrates from east to west and west to east, in obedience to irrevocable law; that the condition of things which promises life and prosperity to a dense population this year may be only a delusion, enticing on to ruin. In other words, that there is out somewhere toward the setting sun a danger line, beyond which common prudence dictates that the farmer should not make his home. The one sees that danger line gradually moving on toward the west, creeping on and up until it lies along the rugged sides of the western mountains. The other sees this danger line as a mysterious and fatal sign, destined in all coming time to lure people on to ruin. A line variable it is true, but still to be found through all time stretching across the State from north to south, and remaining forever a warning of drouth and ruin beyond. The one sees hundreds of miles of what was once the great American desert already reclaimed, and almost a revolution in climate effected by the breaking-up of a very small portion of the surface by the plow. And we find the believer in this doctrine going off in ecstacies over what he deems the wonderful transformation of the plow. But the experience of the past two years has served to strengthen the views of those who advocate the opposite doctrine. And while one sees the most glorious results as speedily to follow up the settlement of the plains, the other class only see the most disastrous results as following upon the abortive attempts to occupy this region. It will be strange if there is not a golden mean between these two extremes; and possibly as horticulturists we may have something to do in occupying this medial ground.

It is the prevailing impression that man is effecting some material changes in the climate of the region west of the Missouri. This impression has had a powerful influence in the settlement of the West. Watching the effect of this impression upon the flood of emigration that has been pouring in upon us, and realizing the importance of the subject, I addressed the following letter, in July last, to Prof. F. Hawn, standing committee on meteorology of the Kansas State Horticultural Society:

> DEAR SIR: In common with hundreds of others, I look with anxiety upon the gloomy prospect now before thousands of the settlers in the western portions of our State. Their all is at stake. They have gone beyond what would seem to be the safe line of settlement, for the present at least. It is popular to say that there is a change taking place in the climatic condition of the great plains; that the rains are becoming more regular, that the drouths are less frequent, and the prospects of remunerative returns to the farmer more certain. This is either a grand truth or a most dangerous heresy. From your observation and study of this subject, can you give us the evidence upon which this belief is founded? And upon what are we to rely for effecting this much-needed change? I call your attention to this subject, because I am sure you will give it a thoughtful and impartial discussion. Yours truly, E. GALE.

In reply to this letter, Prof. Hawn has ably discussed this subject in two exhaustive papers, giving evidence not only of careful thought, but also a thorough acquaintance with this difficult and important matter. The questions discussed are worthy of much consideration. It is to be hoped that the question of planting timber, on account of the influence which it may have in regulating the rainfall, and the danger of denuding by wanton destruction the forests of the Rocky Mountains, will receive the special attention of this Society.

Prof. Hawn says, July 21, 1880: "The subject of your inquiries I have had under consideration for many years, and have written repeated articles to impress the people with the importance of their examination, especially leading to the results now bearing so disastrously on those who are so ill able to bear them. The passion of gain is too strongly in contrast with our civilization, and is at the bottom of those disasters which will result to the instigators as unfortunately as the killing of the goose that laid the golden egg. Yet I am a believer in the possibility of converting most of the Western plains, to the 'foot-hills' of the Rocky Mountains, into practical farming conditions, and have so written, not by spasmodic efforts, in a few isolated spots, but by an approach such as the developed elements and the domestic plants will bear."

While we believe that there is room for difference of opinion in regard to the extent which past culture and forest planting have influenced the climate of this region, I am decidedly of the opinion that meteorological subjects demand more of our thought than hitherto.

Believing that it was essential to get at the real facts in regard to protection for our orchards and farms, I sent the following circular to different parts of the State, and to men who would be likely to give the subject a candid consideration:

MANHATTAN, July 5, 1880.

DEAR SIR: Have your observations and experience led you to regard forest protection in the form of wind-breaks as essential to the successful culture of farms and orchards on the plains? Please give us as full and explicit a reply to the above question as your time and circumstances will permit. Yours truly, E. GALE,

President State Horticultural Society.

The replies, without exception, I believe, favor in the most decided language the planting of forest and especially shelter-belts.

While I have urged this subject upon the attention of our people, I was anxious to know whether our keener and clearer-minded men had really discovered a necessity in the direction of tree planting, or whether it was one of the hallucinations of a few enthusiasts, as some have thought to make the people believe. We may depend upon it that while now and then a man may ride a hobby, all the world will not ride the same hobby. We may discard the argument of the one, but we cannot so easily evade the conclusions to which experience has led the many.

One gentleman writes from Reno county: "I have long been convinced of the importance of shelter-belts of timber. Even in the timbered regions of Indiana it was becoming a necessity before I left there. But it is here on the great treeless plains of Kansas, that this necessity exists in its greatest intensity. Situated as we are, in a principal current of the great aërial ocean, we are exposed to frequent long-continued and fierce winds that drift our soil, damage our crops and prove exceedingly annoying to all the inhabitants." This I may say is not the language of a mere theorist, but of one who testifies to that whereof he knows.

One gentleman who lives well out on the plains, is so far convinced of the importance of forest culture as a matter of public utility, that he is ready to ask for legislation upon the subject. Another is convinced that not only is his orchard benefited by a wind-break, but he finds that his grain is improved thereby. Another, residing in southeastern Kansas, says: "I regard forest culture and forest protection in the form of shelter-belts, as essential to the successful culture of farms, and especially orchards on the plains. My observation and experience from twenty-two years' residence on the plains of Kansas have led me to this conclusion. The general theory that the increase of forests will increase the amount of the rainfall, which I believe to be true, I will not use here, as this subject has been so often discussed; but the benefit of timber-belts for shelter to growing crops is daily witnessed by every observing person. In the growing season the prevailing winds are southern and western, and any barrier, natural or artificial, that will shut off or moderate the force of the winds, materially promotes vegetable growth. The destructive agency appears to be the physical force of the winds in bruising and lacerating the tender growth, and in the continual agitation of the plant during the growing season. For the last two years I have had opportunities to examine hundreds of farms and orchards in southeastern Kansas, in all kinds of localities and surroundings, and the effect of shelter on the south and west in every case is most marked and decided. Especially is this true in regard to orchards and gardens. The present season the winds have been of unusual severity, and of long continuance. Their effects are most visible on all exposed orchards. On their southern sides both fruit and leaves are stripped off, while on the northern sides of the trees the foliage is dense and the fruit perfect. The wood growth is also far more rapid on the north sides of the trees. Protected orchards have a full crop of fruit on the south as well as the north sides, with a symmetrical growth and full, healthy foliage. The protected orchards have twice the amount of fruit that the exposed ones have, and at the same time vastly superior in appearance."

Such is the testimony of men who speak from experience and observation in regard to the importance of protection. It would have been hardly necessary to refer thus at length to this subject of protection, but for the effort made in certain directions to disseminate the notion, that the culture of forests on the plains was more a fitting theme for hobbyists than a necessity.

We have in this discussion to meet three classes of opponents: One tells us that wind-breaks are an injury; another tells us that the plow is all that is necessary to the revolutionizing the plains (and the widest publicity has been given to this idea); another assures us that tree culture will be an impossibility on the plains, and that any change by man of the peculiar climate of the plains is out of the question. To the first we say, wrappings for the child are necessary, but it is only the foolish mother that will smother it; to the second class of writers we simply say, go west and see the sand and dust drifts, and put the experience of the last two years by the side of all your arguments; and in reply to the third class, I would point to the trees that have been growing for ages in protected places far out on the plains.

It remains plainly our duty to encourage the planting of trees, as one of the essential means for promoting the interests of our State. Let us not be deluded by any false or poetical views on this subject. Let us remember that the results of forest culture will always prove beneficial on the whole, and that trees are a more lasting monument than marble. If there were no difficulties in the way, there would be less to stimulate us to our work. Let us recognize the peculiar embarrassments of our position, and remember that we are by slow and well-guarded approaches moving upon a foe as subtle and dangerous as ever withstood the course of man. It is already well settled what can be done in eastern Kansas. Our wants and our capacity are well understood. Twenty-five years' experience has given us an insight into the nature of plants and fruits suited to our region; but when we rise 2,000 or more feet above the sea level, there is a new order of things, and other varieties of fruits and other treatment will be needed. This field demands our attention to-day. What trees, what plants, what fruits and what treatment are suited to the higher altitude and drier climate of the West? These are the questions to which we shall address ourselves, if we are true to the interests of Kansas. We may be proud of what Kansas has accomplished, but let us not forget that as great a problem as was ever presented to any people is now offered for solution in the horticultural development of western Kansas.

Adjourned.

MORNING SESSION.

THURSDAY, December 16, 1880.

[JOINT SESSION.]

President N. J. Colman in the chair. Exercises were opened with prayer by President Geo. T. Fairchild.

HISTORY OF THE SHELDON PEAR.

BY E. N. PLANK, INDEPENDENCE, KAS.

Notwithstanding that most of our best varieties of fruits have originated within the present century, yet they being generally so-called chance seedlings, and gaining only a local reputation while the original trees were living, their origin and real history are already unknown or forgotten. The King of Tompkins County and the Delaware grape, and other varieties that might be named, are among those whose origin is unknown or in dispute. It may therefore be considered fortunate for horticulture and for science generally that the origin of the Sheldon pear, which so good authority as Patrick Barry has pronounced to be, "all things considered, the best pear in the world," can be traced with horticultural accuracy.

The history of the Sheldon pear is especially interesting on account of the peculiar features of its origin and the pleasant incidents connected with it. In the fall of 1807, Mr. Roger Sheldon left the State of Connecticut, with his family, and started to find a home in what was then the wilderness of western New York. That journey of three hundred miles is now a pleasant ride in a palatial railway coach of less than a day's duration; but for that family, in the time of which we write, it was a much more serious undertaking, involving a journey of fourteen days, with ox teams, and with only a trail for a road. But the people who settled western New York, like those who in a later day settled these broad prairies of the West and transformed them into the grain fields that feed the world, were made of sterner stuff than to be deterred from their purpose by any danger that might threaten them. And the Sheldon family moved on in their lonely ride—father, mother, sons and daughters, from infancy to manhood—all filled with hope and expectation of better times to come, and all alike unconscious of the *immortality* that a little incident would confer upon the family.

Reaching Dutchess county, New York, the family stopped for the night at the house of a friend, where an elder son of the family had been at work during the summer. In the evening, the man at whose house they were staying brought in a basket of pears, supposed to be Virgalieus, and while the family were eating them, Mr. Sheldon remarked, that as they were going to a new country, it would be well for them to save the seeds and plant them at their new home. The seeds were saved, the mother tying them up in the corner of her pocket-handkerchief. A woman's handkerchief in those days, if not now, was the safest receptacle for precious things.

The Sheldon family found their new home in what is now the town of Huron, Wayne county, New York. As soon as possible after their arrival, a suitable place was prepared and the pear seeds sown. In the spring the young pear trees appeared, and, nourished by the wealth of a soil enriched by the decayed vegetation of centuries, they grew rapidly.

In a few years the pear trees were large enough to transplant, and those not required by Mr. Sheldon for his own setting were sold and scattered throughout the township. When these trees came to bear fruit, some of the pears proved to be almost worthless, others were only tolerably good, while *six* of the trees bore pears so nearly alike in size, appearance and flavor, that there was little or no appreciable difference in them. And these pears were so good as to at once give them a local reputation, and the fruit of those *six* trees became *par excellence* the "Sheldon Pear."

The Sheldon pear had to pass the usual season of probation, before its merits were fully recognized and admitted; but from the time that its good qualities became generally known, it has been widely disseminated. Cions for propagation were in great demand, and were cut indiscriminately from the six trees above mentioned. The fact becoming generally known, that there were *six* pear trees, all coming from that little nursery, and each claiming to be the original Sheldon pear tree, the question naturally arose among horticulturists, "How did the six pears come to bear the same kind of fruit?" The trees were all of the same age, and gave no evidence of having been budded or grafted; so that the theory of *one* original tree, and the others worked from it, was soon given up. The theory was then advanced, and perhaps generally adopted by nurserymen, that five of the six trees were suckers from the original *one*. This theory, we think, is as untenable as the others, for the trees were all planted out when quite young and before any suckers would probably have appeared, and the six trees all began to bear at about the same time. The most natural, and therefore the simplest and easiest solution of the problem is, that the six Sheldon pear trees, five of which are still living and vigorous, or were a short time ago, were all alike, seedlings and originals. Those persons who are familiar with the old seedling apple and pear orchards that were planted out all over the East during the early part of the present century, know that it was no uncommon thing to find several trees in an orchard bearing fruit alike, or so nearly alike in appearance and quality, that no difference could be perceived in it. On our old homestead in New York there are three pear trees brought from Connecticut more than sixty years ago, and the fruit of those trees, a pleasant fall pear, is alike in all respects. So in an apple orchard planted out by my grandfather in 1814, there were several instances where two or three trees bore the same kind of fruit, and perhaps a half-dozen trees of which the fruit was very similar; and I have observed the same circumstances in other old orchards.

As confirming my own observation in that direction, I have the pleasure of adding the experience of an old and valued friend, Chester Dutton, A. M., of Cloud county, in this State, who, in a letter of recent date, speaking of this subject, says: "I think that duplication or repetition is nothing unusual in the origin of varieties. The first two pear trees I knew, were original fruit, and we never thought of any difference in the fruit. Our orchard in Wolcott, New York, which was planted from the nursery of Mr. Chapin, I think of Canandaigua, New York, afforded several duplicate varieties, three of which were so good that I had them grafted. My great-grandfather Dutton settled in Waterbury, Conn., on land which is described as 'bounded on all sides by the King's land.' He planted a nursery from which several orchards were set, producing several duplicate varieties. Afterwards my grandfather planted a nursery from which more orchards were set, with the same result as to duplication."

In these later days, when few if any seedling orchards are planted, we have little opportunity to witness the origin of new varieties, and we should suppose that the results we have noticed would be less frequent, owing to the much greater number of orchards, and the consequent greater intermixture of pollen. As we should have no difficulty in permanently fixing the characteristics of any given variety of fruit, if we could control the fertilization of the flower, so we can reasonably believe that in the early history of the country, when orchards, and even *bearing* apple and pear trees were few and far between—and especially in the East, where what few fruit trees then were, grew in the openings in the forests, and sheltered from the winds—that a single blossom might be fertilized by the unmixed pollen of some other flower, or by the same intermixture of pollen from several other flowers. In such a case, the seeds growing from the flowers thus fertilized, might give us as many as five or six, or even more trees, that would bear the same kind of fruit. To the common observer, a single pear tree may seem to be a small matter, a single pear blossom of still less importance, yet what a work was wrought out by the life of that pear tree, in the blossom that produced the parent of the Sheldon pear.

I have often stood under those old original Sheldon pear trees, and feasted on their rich, melting, luscious fruit; and as I thus stood regaling myself, and thought of the tens of thousands of Sheldon pear trees now in being, and of the pleasure and profit to be derived from their cultivation, and that all of them probably sprang from the seeds of a single pear, bearing within themselves the germs of so much good, a feeling came over me of respect, approaching to awe and reverence, in the presence of such plant life that could elaborate and perfect, from the common inorganic elements of nature, the melting texture and rich juices of such a fruit. And with respect for the tree, there came an emotion of gratitude to the man whose provident foresight gave so valuable a fruit to the world. Nature, ever willing to reward such diligent care, has built up for him a monument more enduring than tablets of brass and columns of marble, and the name of Roger Sheldon will be held in remembrance by a grateful world, while good fruits are grown and appreciated.

TEA'S HYBRID CATALPA.

BY JOHN C. TEAS, CARTHAGE, MISSOURI.

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About the year 1864, having already growing all the varieties of catalpa then known to cultivation, viz., the common, the Speciosa, the Bungei and the Koempferi, I procured from an Eastern nursery a tree under the name of Japan catalpa. Before I had become well acquainted with this tree, I left my old home in Indiana and came to Jasper county, Mo., where I have since lived, and did not again see the tree for ten years. Two or three years after leaving the old place, I sent back for catalpa seeds, which were sent me without names. Among the plants grown from these seeds were a few (perhaps the product of a single pod) quite unlike any catalpa I knew, and showing so many points of interest that I watched them with especial care, satisfied they were from my Japan tree. Being unable to identify it with descriptions within my reach, I sent samples of the flowers, leaves, seeds, etc., to eminent botanists and others skilled in trees, in different parts of the country, and also tried to trace up the source from which the original tree had come. But nobody knew it. The botanists were unable to give me any assistance, and the efforts to trace the origin of my Japan tree only showed that it was grown from seed imported from Japan without name, other than catalpa.

I have since visited my old place, and a careful examination of the original tree there proved, to my surprise, that it is nothing more nor less than the species common in Japan, and called by some botanists Bungei, and by others Koempferi, and quite unlike the seedlings I have grown from it. There could be but one solution of the difficulty, and that is, that the flowers of this tree have been fertilized by those of the Speciosa, which grew not far from it—and thus was produced, by natural hybridization, this new variety. This idea of hybridization had before been suggested to me by Robert Douglas and others as possible, but I felt reluctant to accept the theory, until after I had examined the old tree.

The characteristics of the new variety are very marked, and partake largely of those of both its parents. In its vigorous, upright growth, it even surpasses either. In its foliage—large, luxuriant, and often, though not always, lobed, something like a maple or tulip poplar leaf—we plainly see the Japan influence in its parentage, while the American is unmistakably shown in the profusion of its large and handsome white flowers. The seed pods and seeds are very distinct, and are intermediate between those of Speciosa, which are the largest of all, and Bungei, which are the smallest. It is the most profuse bloomer of all the catalpas, being literally loaded with flowers, and remaining in bloom several weeks—a much longer period than other catalpas. The individual flowers are the size of those of the common, not so large as Speciosa, but this is more than made up by their greater abundance. They are white, with small, purple dots, and a touch of yellow around the throat, which last is a mark from the Japan side. The flowers are borne in clusters of extraordinary size, sometimes numbering as high as three and even four hundred buds and blooms in one great panicle. They do not all open at once, but keep up a succession of bloom for a long time. The flowers have a very pleasant and delicate fragrance, and a tree in bloom not only presents a magnificent spectacle to the eye, but also fills the air for quite a distance with its agreeable odor.

The past spring (1880) I sent Prof. George Husman, at the Missouri State University, one thousand very small trees—culls out of the one-year-olds—many of them no larger than small straws. They were set in nursery rows late in May, and though it was a dry and unfavorable season, they made a surprising growth, many of them reaching a height of six feet or more, and from one to one and a half inches in diameter, and straight as young Lombardy poplars. I also sent a dozen larger trees of the same, which were delayed on the way, and he wrote me were as dry as sticks when received, and he thought ruined. However, he planted them, and every one not only lived, but made a good growth. Some years ago I sent him cions of this catalpa, which he grafted upon the common, and they made a wonderful growth, some of the leaves reaching the enormous size of eighteen inches across.

Small trees planted in village lots grew without cultivation, in five years, to be twenty-five feet high, and twenty-four inches in circumference at one foot from the ground; and I measured one shoot in the top of one of these trees which had grown eight feet in a single season. We have grown many thousands of these seedlings, and it seems like being a well-established variety, though, of course, there are slight variations among the seedlings.

We believe this Japanese hybrid is destined, when known, to take a prominent place in the very front rank of trees for timber as well as ornamental plantations. In rapidity of growth it rivals the most luxuriant trees of temperate climates, while its hardiness has been demonstrated by its standing uninjured with the thermometer at 20°, and even more, below zero.

DISCUSSION — FORESTRY.

PROF. G. HUSMAN: The Catalpa Speciosa is most desirable; is hardy, easy to transplant, and free from insect attacks. Closely-applied tests should be made by our agricultural colleges for the purpose of determining a successful list of forest trees.

J. B. SCHLICHTER: Grasshoppers eat them.

MISS M. L. MACY: Do not forget the nut-bearing varieties. They are profitable for their fruit and wood.

E. N. PLANK: The whole influence of this Society should be used to prevent the wholesale destruction of our native forests. The black walnut is one of the most valuable.

PRESIDENT COLMAN: The durability of the catalpa wood is wonderful. Black walnut wood is so valuable that the roots even are dug and appropriated to various useful purposes. It is a most excellent tree for the prairies.

F. WELLHOUSE: The black walnut is and will be the mahogany of North America. We found it succeeding at Hutchinson, in tree-growth and fruiting. Plant the black walnut. The red cedar is to the evergreen class what the black walnut is to the deciduous.

DR. BOHRER: This Society must give every encouragement to tree planting. I have said to our settlers, you must plant trees, or you will be driven from the Arkansas valley. It is not within the nature of civilized man to remain long in any country without the advantages and influences of natural or artificial forests. The western counties of this State must grow timber, and that speedily, or there will be a scattering of the people and an abandonment of the country.

FORECAST OF THE APPLE CROP FOR 1890.

BY SAM. REYNOLDS, LAWRENCE.

In representing this question to this Society, I do not expect to offer much that is either new or instructive, knowing that the subject of apple culture has been so often and so ably discussed by those of much more practical knowledge and experience than I can claim. Yet, considering that this Society is made up of individual members, each one of whom has a duty to perform in helping forward the good work in which we are engaged, I hasten, without further apology, to submit this short and unpretentious contribution.

Twenty-six years ago, portions of the Territory of Kansas were opened to settlement by the United States Government, and settlers from all points of the compass at once commenced occupying its eastern portion, making claims and laying out towns. Whether the controlling motive in the settlement of Kansas was to consecrate the soil to freedom or desecrate it to slavery, or whether the purchase of 160 acres of her virgin soil for $200, on which to erect a home and from which to produce agricultural and horticultural crops, is not our purpose to discuss. Suffice it to know that the first settlements were made in 1854, and annually since then thousands of immigrants have followed the "star of empire," till now the population of Kansas numbers a round million.

By most of the early settlers it was considered a waste of time and means to plant apple trees, considering, as they did, the unsheltered condition of most of the land to be too unfavorable to produce a crop of fruit. Our apples therefore had to be procured from our Missouri neighbors, who seemed quite willing, yea, anxious, to grow them for Kansas *ad infinitum*, and furnish them in the orchard for 50 to 75 cents per bushel, or deliver them in our principal towns for $1.50 to $2 per bushel. For the first twenty years of her existence, Kansas was supplied mainly through this channel, we sending in return thousands of dollars annually back to that State. Not more than five or six years ago, wagon-loads of Missouri apples might have been seen on the streets of Lawrence selling for one dollar and upward per bushel.

Although a majority of the first settlers were discouraged from planting orchards, yet a few men, more persevering and enterprising than the rest, had sufficient faith in our soil and climate to send to Rochester, N. Y., and other points, for nursery trees, many of which grew thriftily, and in due time began to bear fruit. As soon as the fact was established that apples could be successfully grown here, a great demand for nursery stock was at once created, and orchards of from one to twenty acres were planted on almost every occupied quarter-section in the most thickly settled portions of the eastern counties. A large proportion of the young trees brought in from other States was either untrue to name or entirely unsuitable to our soil and climate. The immediate results were, consequently, very unsatisfactory, and many became not only discouraged but disgusted, with the business of apple growing. But out of the hundreds of varieties planted it was found that a few succeeded well and bore fruit abundantly. This so encouraged tree planting that most of the orchards were enlarged and supplemented with the approved varieties.

WIND-BREAKS.

At first it was considered futile to attempt to grow orchards without wind-breaks; consequently extensive belts of timber, indigenous and deciduous, were planted around many of our orchards. Time has shown, however, that where they are unprotected from the winds by such belts of timber they succeed equally well. A free circulation of air through the orchard is conducive to the health and vigor of the tree and the perfection of the fruit.

THE TABLES ARE TURNED.

The old dispensation has passed away, and the new is ushered in. We no longer send away our money by the thousands and tens of thousands annually for a supply of apples. We can now supply our own wants and those of our near and remote neighbors. In the county I have the honor to represent, not only is there a home supply raised, but also large quantities for shipment. The amount of apples shipped the present year by railroad from the city of Lawrence alone foots up ninety-one car-loads, or 13,700 barrels, which, at $1 per barrel, (about the average price paid by shippers,) amounts to $13,700. In addition to this, hundreds of wagons were loaded with winter apples for counties west. The writer loaded several wagons for Pottawatomie, Riley and Cloud counties. The home consumption was also extravagantly large. Apples were worked up, cooked up and used up in every conceivable way, without stint or measure. It would be safe to estimate the crop of the county at three times the amount shipped by railroad. This quantity, at 40 cents per bushel, amounts to $45,210—and this for the one kind of fruit.

In the county there are 197,555 acres of land, or 1,234 quarter-sections. The number of apple trees, bearing and not bearing, in the county, is 206,559. This makes an average of 167 trees and 91 bushels of apples to the quarter-section. I would here state, incidentally, that 258,360 pounds or 129 tons of grapes were shipped from Lawrence by express the present season.

But in order to answer the question propounded by the caption of this paper it is necessary to consider what is possible for the other counties of the State to produce by the next decade. There are seventy-nine counties in the State. Now suppose these seventy-nine counties should at once plant largely of those varieties known to be productive and early bearers: there is no doubt in my mind but the average of each of these seventy-nine counties, ten years hence, would be equal to the present crop of Douglas county. By this estimate, the apple crop of Kansas in 1890, would amount to 8,927,975 bushels, which, at the very moderate sum of 40 cents per bushel, would amount to $3,571,190. This I think will not be considered an over-estimate, when we consider that by the knowledge gained from the experience of the past, more could be accomplished within the next ten years than has been achieved in the past twenty. Surely, this result is worth laboring for. Who can doubt the great importance of this industry, both in its material and hygienic benefits to the State?

How to accomplish this result is a question which naturally suggests itself. The following brief directions for planting and taking care of orchards are suggested as the result of twenty years' experience in Kansas:

SELECTING THE ORCHARD SITE.

Soil of sufficient fertility to produce a good crop of corn is necessary in order to have a thrifty orchard. If possible, the site should be selected on a gentle slope contiguous to land lying several feet lower, which acts as an air drain, protecting the fruit-blossoms from the late spring frosts. Orchards thus located often escape frosts which destroy the bloom of trees on higher locations without the air drain.

PREPARING THE LAND.

After the prairie sod is thoroughly subdued, the ground should be plowed into lands two rods wide, the center being made by turning two back furrows together. Then cross these lands with a plow at right angles, the furrows being made two rods apart, and plant your trees where this furrow crosses the center of the land. The trees will then stand 33 feet apart each way.

NURSERY STOCK.

I would caution the purchaser against buying of tree peddlers, whose stock is generally unreliable in name and quality, and whose prices are often such that good trees from Kansas nurseries may be had for half the money. If you wish to be dealt with honestly and honorably, shun the apple-tree peddler. If you are planting for market purposes, let the great majority of your trees be of the winter varieties.

ROOT PRUNING.

Before planting the young tree, the roots should be pruned to an even length, that is, the long roots should be cut back, as this system will allow the tree to stand firmly and grow erect. The tops should not be pruned till after the young tree has taken root, and made a start. Plant your trees but a little deeper than they stood in the nursery row, taking great pains to shake the fine soil around and between the rootlets. Then pack the soil firmly around the tree with the foot, and the work is done. The planting should be done as early in the spring as the soil can be worked without causing it to bake. It is an excellent plan to mulch the trees with hay or long manure before the hot season begins. Then, in the following fall, they must be protected against the depredations of the rabbits. For this purpose some people recommend "catnip," and others, "the bark of a dog;" but as the animals from which these remedies are extracted are very erratic in their habits, and so often found off duty, the remedies are not very reliable. The best protection is a bandage of hay or straw tied around the trunk of the young tree, and removed on the opening of the following spring.

CROPPING THE YOUNG ORCHARD.

The young orchard should be annually planted with such crops as early potatoes, beans, corn, or any others that require thorough cultivation. This should be continued till the trees come into bearing, when the ground may be seeded down with red clover, or, what is still better, kept well stirred through the growing season with a two-horse cultivator sufficiently often to keep all weeds down, and the soil well loosened up.

MANURING THE ORCHARD.

A good top-dressing of barnyard manure every two or three years after the trees come into bearing will not only keep them thrifty and vigorous, but will enable them to retain and maintain the size and quality of the fruit.

NOXIOUS INSECTS.

The unfriendly insects must be closely watched and exterminated. The most common and destructive of the life of the young tree is the crown borer. This insect can be detected by the chips thrown out near where it is operating under the bark. If left unmolested, it will soon girdle and kill the tree. It is of the utmost importance, therefore, that it be destroyed as soon as detected. This can be done by digging it out with a knife or chisel, or any other sharp instrument. The other insects quite often found in Kansas orchards are, the flat-headed borer, the aphis or root louse, the codling moth, and tree cricket. This last insect has been very injurious to the fruit the past season, by puncturing the skin, causing premature decay. In this short paper not more than a passing mention can be made of these last-mentioned insects.

LOVE FOR THE WORK.

The successful fruit grower must take pleasure in his vocation. He must, like a tender parent, protect his young tree from all its enemies, cultivate it well, and train it in the way it should go. He should watch the swelling bud and opening blossom with emotions of delight; and the ripened fruit should be gathered and valued as Nature's richest gift to man.

COUNTY SOCIETIES.

Another necessary factor in securing the realization of my estimate of the apple crop of 1890 is, the local or county horticultural society. Such a society should be organized in every county where fruit can be successfully grown, and everyone who desires to promote the interests of horticulture should be one of its members, and make it a matter of principle to attend its meetings whenever possible. At these meetings the choicest of the horticultural products grown should be displayed, and varieties, conditions of soil and location, modes of culture, etc., should be freely discussed. In this way each individual member receives the benefits of the combined experience of all. The exercises should be interspersed with essays, lectures and music. It often happens that the services of some one of literary distinction or scientific knowledge can be obtained by special invitation. Such societies increase interest and stimulate action.

Another means of success in such societies is the social custom of serving refreshments. This feature necessarily brings out the ladies, whose presence always lends a charm to all such occasions. In fact, it would be difficult to keep up the interest for any great length of time without the presence and coöperation of the ladies. The young people of both sexes should also be encouraged to attend those meetings. They would thus receive an early and practical training for this ennobling vocation.

THE STATE SOCIETY.

This Society is a school; trees, plants, flowers and fruit, the text-books; experience, the preceptor; and its members, the students. Here we meet to teach and to learn, to impart and to receive. The horticultural knowledge and experience of the whole State is here concentrated, and mutually and reciprocally distributed. The horticulturist who would ignore the teachings of this Society or fail to take an interest in its proceedings, must be sadly unmindful of the duty he owes both to himself and the horticultural community. Our State Society has an extensive field of labor before it. Much has been accomplished already in disseminating horticultural knowledge throughout the State, and by the active and faithful labors of its friends and the necessary material aid from the State, it will accomplish incomparably more in the future.

THE COMING APPLE.

No doubt the character of the coming apple, if it comes in time, will exert great influence on the crop of 1890. The worthy Secretary of this Society, in describing the coming apple at the November meeting of the Douglas County Society, said that it must be of full medium size, red in color, firm in texture, rich in quality, an early and profuse bearer, and possessing the best of keeping properties. Such is his and our ideal of the coming apple.

Two years ago the President of this Society appointed a committee for the purpose of testing new varieties by the propagation of both seedlings and hybrids, with a view of producing an apple that will fully meet the wants and requirements of Kansas. It is to be hoped that this important committee has been actively at work, and that it will be able at this meeting to report progress. I consider this one the most important of all the committees appointed.

IN CONCLUSION,

I would reiterate the fact so often stated in various forms, viz., that nothing of great value is obtained without commensurate effort and labor, and that the price of a rich harvest of this best of all fruits, the apple, if not "eternal vigilance," is persevering labor and unremitting attention.

Adjourned.

AFTERNOON SESSION.

THURSDAY, December 16, 1880.

[JOINT SESSION.]

The report of Standing Committee on Botany and Vegetable Physiology, by J. W. Robson, of Cheever, was read, and will be found in the department devoted to "Reports of Standing Committees."

COMMITTEE ON FINAL RESOLUTIONS.

The President appointed Messrs. Joseph Savage, D. C. Hawthorne and J. B. Schlichter, as said committee.

AIMS AND PURPOSES OF THE STATE AGRICULTURAL COLLEGE WORK.

BY PRESIDENT GEO. T. FAIRCHILD.

Mr. President, and Gentlemen of the State Horticultural Society: I promised you some account of what the Kansas State Agricultural College is trying to do for horticulture, and as Prof. Popenoe, like myself, prefers *doing* to talking, I shall briefly fulfill my promise.

Looking first to our general course of study, you will find it planned to set students of the first year upon such study of plants, according to general principles of botany, as fits them for a course of fourteen weeks in horticulture at the beginning of the second year. This course includes subjects in both fruit and vegetable gardening, with actual practice in grafting and budding. Students of both sexes are required to pursue these studies. In the second year, the study of entomology also keeps up interest in insects injurious to gardens and orchards, as well as farm crops and forest trees. The third year gives, in agricultural chemistry, a study of growing plants, a large part of its illustrations being related to horticulture. The fourth and last year gives a term to physiological botany and gardening, especially the laying-out and planting of ornamental grounds, while the drawing department encourages, by the principles of symmetrical art and platting. To such as desire, this department furnishes special practice for one hour a day, and does all its actual work through students. The number to be employed is increasing with the growth of the department, and the applicants for special instruction are more numerous, as the variety of employment gives a greater range of instruction. In all this course, the effort is to train, in practical observation of facts and application of established principles, in the improved practice of our times.

Turning now to the out-door work of the department, you may find several orchards in which the effort is to build toward a collection of sample trees, fit to show the character of the different varieties in our locality; a vineyard serving the same purpose; and a small-fruit garden already showing good results, but promising better; a collection of ornamental shrubs and trees worthy of extension, and a considerable plantation of forest trees. The general care and adornment of the grounds also falls under the charge of the Professor of Horticulture. Some degree of success has attended the efforts at cultivating bedding plants upon the lawn. Plantations of trees are being scattered in places suitable, and vines are being trained over the stone buildings. The place is still crude; grading and building yet remain to be done, the natural entrance to the grounds is yet to be opened after the completion of the main building, and the former plantations of trees have had little adaptation to the proprieties of the landscape. Indeed, until this year, a road has divided the buildings and grounds so as to preclude all thought of present beauty. But as fast as means permit, with a very moderate income of less than $19,000 last year, the work of development goes forward. Our chief problem is to correct and revise the planting we have, so as not to seem destructive; for it is sacrilege to destroy a tree in central Kansas.

We have begun an arboretum, in which we hope to gather samples of trees and shrubs of all kinds that can grow in our climate. A "wild garden" will soon be attempted, where the numerous indigenous plants can be seen and tested. The vegetable garden will be kept in shape to illustrate various modes of culture, and to experiment with varieties. A propagating pit has recently been erected, at very slight expense, to aid in experiment and provide bedding plants for our borders, as well as to illustrate the principle in horticulture. This, we hope, may grow into a comfortable greenhouse, for we believe "that to him that hath shall be given."

Our collections of woods and plants are increasing, and are finding their place in suitable cases for use and show. Collections of native and cultivated grasses are begun, and will be largely extended. Sample beds have been planned, and, so far as the season permitted, put in shape, to show the character of varieties.

In conclusion, it is the plan of Board and Faculty to build up this department as means are at hand, so that the College may be recognized as a leading influence over the State toward a larger interest in that art which so much concerns the comfort and beauty of our homes. Its students already catch the spirit of its teachings, as is shown by the interest taken by the graduates and others in such societies as this. Long before their locks are gray or their eyesight dim, as so many of ours are shown to be, they plant trees and show the fruit, or present their thoughts in these meetings. Such an influence will increase with the new efforts put forth, and every step in the progress is felt at once upon these young farmers and mechanics—or their wives—who are to make the future of our State.

THE NEW PEACHES IN 1880.

BY H. E. VAN DEMAN, GENEVA.

Owing to a rather short crop in the northern half of the State, the reports are not so general and full as was desired, in order to determine the real value of many of the new varieties in Kansas. Over the southern half the crop has been good, and in the extreme southern counties *very heavy.*

Among the new peaches, the real merit of the varieties as to earliness seems to be the leading object. To even *name* those of which it is claimed are several days in advance of Amsden, would be quite a task. Many persons in almost every fruit-bearing portion of the State have favored me with reports, giving names and exact dates of ripening, and in some cases I have received specimens. In my own and neighboring orchards I have had good opportunities of observation, and what seems to me should be given in this report are, the *conclusions gathered from these testimonies.*

Some general points seem noticeable: One is, that all of these new extra-early seedlings are from seed of Hale's Early, and resemble that variety *very closely* in all points, except date of ripening. The hardness and fine color of this family are to be commended, but we hope for a class as early and of better quality. There is scarcely to be found one of these early varieties that is clearly a freestone. Some are decided clings, and the others, as far as I have been able to *definitely* ascertain, are partially free.

As to the time of ripening, it varies even in the same variety as much as a week or ten days, and that on the same farm. If a certain tree ripens its fruit a week earlier than Amsden, it is no *sure* indication that it will do so another year. The peculiar soil, the vigor of the tree, and the treatment, all have much influence in retarding or advancing the time. It should be borne in mind by all, that lack of cultivation, or a diseased state of the tree, will hasten ripening. A neglected seedling tree will often ripen its fruit earlier than trees propagated from it.

It may be safely stated, after taking all the varied reports from this State and others into consideration, that Amsden and Alexander are synonymous in all points except origin. It may also be stated that as yet there is no variety that has been thoroughly tested in various places, and settled upon as earlier than these two varieties. Almost every township in the eastern part of the State has one or more claimants for this position, and I am willing to risk the statement that not one of them will prove worthy of the place after several years' trial in different orchards.

If I may be pardoned for overlooking many that are as good as those I may name, I will make a few brief statements, and all very nearly alike, concerning some of the popular candidates for precedence over Amsden and Alexander.

Wilder, *Downing* and *Saunders*, are seedlings of Hale's Early, by Mr. H. M. Engle, of Marietta, Pa. But as yet, they have shown no constant points of superiority, except it may be the size of Wilder, but this is not certain.

Baker's Early is perhaps one of the finest and most promising; originated in Crawford county, Kansas.

Brice's Early has not proven in any way superior to Amsden; *Ashby's Early* the same.

Waterloo, a New York seedling, has not been tried much yet, and has no special superiority.

Musser is one of Engle's largest and finest very early seedlings, but needs further trial.

Hynes's Surprise, from Missouri, is very well spoken of in Texas, as well as at home.

Gov. Garland is a fine cling from Arkansas.

Bowers's Early is nothing extra.

Harper's Early is thought by Mr. G. B. Brown, of Guilford, Kansas, who has many trees in bearing, to be just like Alexander.

Wyandotte Chief, from reports, and a specimen sent me by Judge Newman, is similar to the above.

McKeever's Early is thought (like many other pets) to be something extra; but it needs trial; it is from near Thayer, Kansas.

Nugent's June and *Nugent's Ottawa Early* still seem to be highly favored, but need more trial.

Emporia has fallen four days behind Alexander this year, which proves only that it varies a little, as do all the rest.

Bucher's Best, from near Emporia, Kansas, ripened with Alexander.

Red June is a new variety from a seed of Alexander, planted by H. P. Welsh, of Ottawa, Kansas, and is very promising for size and beauty.

Besides these, there are many unnamed seedlings of almost exactly the same character. Mr. C. C. Kelsey, of Humboldt, Kansas, has several similar to each other, and just like Amsden. Mr. Wm. Cutter, of Junction City, Kansas, has fruited a number of his early seedlings, and has one that he and others think superior to Amsden. Mr. Cutter truthfully says he "thinks it a fraud upon the public to continue to send out under new names" these varieties that are all alike. S. M. Irwin, of Geneva, Kansas, has about a dozen seedlings that fruited this year for the second and third times, and were as good as the best Amsden or Alexander I could find. Of my own seedlings, I can only say that I feel certain that at least twenty of them are as good as Amsden, and perhaps some may be better. Time will tell. At present I will not risk their dissemination, except for trial. Like Mr. Cutter, "I fear that all the advantages claimed for larger and earlier peaches than Amsden and Alexander are mere exaggerations," when reduced to continued trials, Mr. Brown, of Guilford, appropriately says, that "mortal man should not attempt to say the day that any peach ripens."

Granting this to be enough on this, to me, monotonous subject of very early peaches, I pass to those a little later.

Early Beatrice is quite small, but very hardy and productive, and highly colored. It ripens just after Amsden, and before they are quite all gone, and is worth retaining until we get a better one of its season.

Close upon this is *Early Louise*, another of Mr. Rice's famous English seedlings. It comes before Early Beatrice is gone, and continues until Hale's Early begins to ripen. Of all the varieties fruiting in my orchards, it has so far proven the hardiest, and for mild, melting delicacy of flesh, one of the very best. It is not fit for shipment, but for home use no list is complete without it.

Early Rivers is just a litte later, and of a delicate, creamy color, and some think, superior to Early Louise in size and flavor.

Thurbur, a freestone, is said to be one of the finest seedlings yet produced from that new and most excellent variety, the Chinese Cling. Mr. Berkmans, of Georgia, has the honor of its origin.

Family Favorite, is another seedling of Chinese Cling, a freestone, grown by W. H. Locke, of Bonham, Texas. It is very large, and quite early. Its quality is said to be very high.

Chinese Cling is comparatively new in Kansas, but should be carefully tested here, as it is a very large, creamy-white peach, of decidedly good quality, and early.

Mountain Rose is one of the very finest of the newly-introduced peaches, and comes just a little after Hale's.

There is nothing new of striking character in the midst of the peach season that has come to my notice.

Shipley's Late Red is a very fine red-and-white freestone, that comes late, (after Crawford's Late,) that should be thoroughly tried, as it has done well with me so far, and has a good name elsewhere.

Mrs. Brett was the finest peach on the table at the great St. Louis fruit show last September. It is large, red-and-white, and of the highest flavor.

Steadley takes first rank as a late white freestone. Its size and richness are very superior.

Wilkins's Cling is larger and fully as rich as Heath Cling. It should be planted by all lovers of good fruit.

Piquet's Late is attracting much attention in Texas and Arkansas, because of its high quality, large size and rich red-and-yellow color so late in the season.

Bilyeu's Late October is too late for Kansas. I gathered the first ripe specimens about October 15th, and some of them long after winter began.

To sum up the experience of this year, I will say, with Prof. Munson, of Denison, Texas, that "we will have to patiently await another year's trial."

Respectfully submitted.

THE COMING MAN AND WOMAN OF KANSAS.

BY MISS M. L. MACY, LAWRENCE.

We have heard discussed in almost every meeting of our horticultural societies of late "the coming apple." I beg leave to digress from the common horticultural topics, and see if we can tell what the coming Kansan is to be who is to eat the coming apple.

There is something in the pursuit of horticulture which exerts a greater influence in moulding the human character than any other occupation, and by attention in that direction, the greater will be this influence for good. Do you suppose, had it not been for this influence, that such minds as Homer, Socrates, Plato, Diocletian, Virgil and a long list of other great minds would ever have been given to this world? Ah! —

The native orchard's fairest trees,
  Wild springing on the hill,
Bear no such precious fruit as these,
  And never will:

Till ax and saw and pruning-knife
  Cut from them every bough,
And they receive a gentler life
  Than crowns them now.

And Nature's children, evermore,
  Though grown to stately stature,
Must bear the fruit their fathers bore —
  The fruit of nature —

Till every thrifty vice is made
  The shoulder for a cion,
Cut from the bending trees that shade
  The hills of Zion.

Sorrow must crop each passion short,
  And pain each lust infernal,
Or human life can bear no fruit
  To life eternal.

For angels wait on Providence,
  And mark the sundered places,
To graft with gentlest instruments
  The heavenly graces.

In reading the lives of all the great minds that have ever lived, I believe I never have found a single exception but what loved the garden, and where they spent much time indulging in those æsthetic tastes which elevate the mind, refine and purify the life, and ennoble the soul; and it was in the garden, surrounded by those gorgeous yet sweet refiners of nature, that the thoughts were penned that immortalized them.

The earliest gardens that we have any account of, aside from the garden of Eden, were those of Solomon, which were quadrangular in form. The gardens of Cyrus and the Persian monarchs, were distinguished for the diversity of their uses. In the description of the gardens of Babylon, by Herodotus, there were terraces decorated with vases, and groves containing fountains, seats, parterres and banqueting-rooms, and combining the most exquisite and minute beauties of flowers and foliage, with masses of light and shade, and extensive prospect. The grove or garden of Orontes, described by Strabo, was one of most picturesque style and vast in extent, being nine miles in circumference; and the gardens of Athens were ornamented with temples, altars, tombs, statues, monuments and towers. Those old ancients, in that cradle of civilization and learning, did not try to see how much they could crowd into a few short years, but lived quietly and contentedly, searching for knowledge; and they attained it in the arts and sciences, scarcely equaled at the present day. An American child of fourteen now knows as much of the world as one of those old sages did at forty. America has no individuality. We are a combination of the fanciful ideas of the French, the practicality of the German, the clear reasoning of the Grecian, the policy, "Will it pay," of the English; and so much of this latter have we got, that in every horticultural journal you take up you find the headings, "Two hundred and fifty dollars from an acre of raspberries;" "Money in strawberries;" "How to make the most money from a peach orchard;" "How to get rid of the apple borer," etc.

All this is right enough; but while we cultivate that which is for the physical man, we must not forget that which is to benefit the moral and intellectual, for neither is complete without the other. The fruit garden teaches lessons which the flower garden does not, and *vice versa*.

Hawthorne says: "My fancy has always found something very interesting in an orchard. Apple trees and all fruit trees have a domestic character which brings them in relationship with man. They have lost in a great measure the wild nature of the forest tree, and have grown humanized by receiving the care of man, and by contributing to his wants. They have become a part of the family, and their individual character is as well understood as those of the human members. One tree is harsh and crabbed—another mild; one is churlish and illiberal—another exhausts itself with its free-hearted bounties. And even the shapes of apple trees have great individuality, into such strange postures do they put themselves and thrust their contorted branches grotesquely in all directions. And when they have stood around the house for many years, and held converse with successive dynasties of occupants and gladdened their hearts so often in the fruitful autumn, then it seems almost sacrilege to cut them down. For how much is one indebted to those leaf organs of changing tones of the trees around one's dwelling? How many whisperings of thoughts breathed like oracles in one's ear? For how many new shapes of beauty moulded in the leaves by the wind and sunshine? For how much companionship and solace, steadfast and constant year after year, until one grows strong in their sure confidence, and welcome and staid sweet fidelity, until one grows to love them e'en better than the human summer friends who flit with every shadow? One cannot realize the companionship there really is in Nature, until we come to commune with her and read the silent yet unmistakable language on her bright pages, and when we consider what is laid up in store for *us* in the coming years — the dew and sunshine, the sparkling waters, the tints mixed for every variation of flower and leaf, and even the songs of the welcome birds in coming summers."

"Lords of the soil," as Willis says, "is a title which conveys your privileges but poorly. You are masters of waters flowing at this moment, perhaps, in the river of Judea, or floating in clouds over some spicy island of the tropics, bound thither after many changes. There are lilies and violets ordered for you in millions, acres of sunshine in daily installments; and dew, nightly in proportion. There are luscious fruits in their seasons; throats to be tuned with song, and all tributaries to *you*. There is perfume distilled for your flowers, juices for your fruits, shade for your refreshment at noon, breezes and showers and snow-flakes — all will be here in their season, and deeded to you. Gods! what a copyhold of property for a fallen world."

But while we contemplate, and try to appreciate all these gifts of nature, we must remember that such things did not inspire the same thoughts in the childish mind, and while we take comfort and solace in the deep, continuous, ever-changing companionship of nature in its broader sense, we must not fail to provide that which will lay the foundation for such noble thoughts and feelings in the coming man and woman of our noble State. And how are we to do this? A child's first impressions are made through the sense of seeing; its first association of nature is flowers. It is said that more bouquets are bought in New York in one day than are bought in London in a year. While I would not depreciate the quality which prompts this wholesale purchase of cut flowers, the extent of it reads us rather a sad lesson that the fashionable love for the gay and showy is being cultivated, while the deep, purifying true love for the sweet harmony and soul-communion of a *living* plant is being neglected. How few in this country grow the flowers they wear in their hair and button-holes, and hold in their hands! How few look upon them as eloquent but silent teachers — lessons written by the Divine hand.

Kansas has taken precedence in so many noble deeds and works, I hope to see the day when she comes out in this direction, and reads her Eastern sisters a lesson in such unmistakable lines of intellectual growth that will be as easily defined as those of the ancient Greeks. The time was, when men came

West to make money for a few years, and then return East to spend and enjoy it; but to many, the gold they acquired was to them the true lotus flower which the ancients tell us if once tasted of, causes forgetfulness of former country and love for the one where they were. The cabin or dug-out has given way to a commodious dwelling, forest trees, and in many cases fruit trees spring up as if they grew from the impress of the white man's foot! But the eye searches for those sweet refiners, old friends that seem essential, that *are* essential to a perfect home, the bright flowers.

O man! when God made these vast prairies, he planted them with flowers. Do you dare to appropriate it all to your greed of gain, and leave no place for that which was sown by a Divine hand?

As I pass over the country, which I know once blossomed equal to the fabulous "Garden of the gods," and see what desecration in this particular that man hath wrought, I wonder, O man, where art thou, created a little lower than the angels? Can it be that one dwells here? I would gladly think not, but the door swings back and some half-dozen little heads crowd in front of one of those images, to see who is passing.

Those of you who are familiar with the shore, may have seen attached to the inundated reef a creature, whether plant or animal you could scarcely tell, rooted to the rock as a plant might be, and twirling its long tentaculæ as an animal would do. This plant-animal's life is somewhat monotonous, for it has nothing to do but grow and twirl its feelers, float in the tide, or fold itself upon its foot-stalk when the tide has receded, for months and years together. Now, would it not be very dismal to be transformed to a zoophyte? Would it not be dreary, with the human soul still in us, to be anchored to a rock, able to do nothing but spin our arms about or fold them up again—knowing no variety except when the receding ocean left us in the daylight or the returning waters plunged us into the green depths and brought us the prize of a periwinkle or an invisible starfish? Dare I draw the comparison?—are they not analogous? What greater variety marks the life of this being of Divine image than chequers the life of the sea anemone? Do not the days float over her life of certain mechanical routine of rising, dressing, washing, cooking, eating, and going to bed again? I have often thought, O mortal woman! is this the life to be living for one who has assumed the responsibility that thou hast? And to you sisters who are surrounded with all the necessaries, and seemingly could have all the comforts of life, and to all appearances do—what are you doing to enlighten, purify, ennoble and expand, not only the minds of your own family, but all those who come within the circle of your influence? and none of us knows the circumference of that circle. You plant your yard with flowers, aside from the untold wealth it be to your own family: a stranger comes by—it may be the prodigal son, foot-sore and weary; he may be planning some desperate deed; he notices your flowers; he recognizes those that grew in his mother's garden, that he used to love and gather with childish hands; how quickly old, loved faces gather round him; invisible voices babble of sweet by-gones; tears spring to his eyes, the fount of his better nature has been reached, and he passes on, resolved to honor the dear old mother and the home of his childhood, and be a man. No one lives entirely for himself in this world. The web of each one's life is so interwoven with threads from the lives of others, that we should all strive to make the threads of our own that are interwoven into the web of other's lives pure and bright as threads of gold.

Some good sisters tell me, sometimes, that they can't find time to cultivate flowers. I tell them I had rather have but one dish upon the table at a time, and that well prepared, if such economy was the only way by which I could secure the required time. When you once *try* to economize time, you will be surprised how much you can find, almost every day, to spend in that which will beautify and make your home a *real* home. If I had a fortune to spend, (and it wouldn't take a very great one, either, to do wonders in this direction,) I would make a flower garden to every home in Kansas, and in twenty years from now I would show you the Athens of America, not only in external beauty but in intellectual growth.

There is no telling what a flower garden will do. It will cause the old cans, boots, pieces of carpet, etc., to be gathered up out of the back yard, the chickens will be picked further from the house, boards will be gathered up, a pig-sty made, and bits of blue-grass put here and there, and by-and-by a nice green-sward extends around the house; the boys nail the boards on the fence and make a front step, the children speak more pleasantly to each other, and are more ready to help mother, and now even anticipate her wants, which gives her still more time to devote to them and the improvement of her own mind. The children save the eggs, gather up a penny here and there, and new books and papers begin to find their way into the house—and how well they are read and remembered! The father begins to notice how the children's taste's and mamma's have improved, how cheerful they are in disposition, how well they are getting along at school; his wife, too, is always now neat and tidy—snowy collar and hair smooth. And how clean and nice the table looks! He begins to be more careful about his own toilet, brushes his hair before the glass, removes his coat in which he curried the horses, and even takes an extra half-minute to clean his finger nails before sitting down to the table. He begins to be ashamed of the barn lot in comparison with the yard, so he finds time when he really looks for it, to haul out the residue on to the hungry fields, and his next year's crops thank him for his labor; he now manages to finish the fence around the lot, and find some place to stow away his tools *in shelter*. The farm produces more, and notwithstanding the apparent increase in expenses, he finds it easy to meet them, and he sends for another paper.

But the influence does not stop here; this is but the commencement of a series of salutary lessons which follow every one to produce a greater and still increasing good, and instead of it being a dread to ornament his home, it becomes a labor of love. One family beginning to ornament their home, their neighbor sees the improvement and begins to see his own home through a different lens, and this stimulates him to do likewise; and so the influence goes on, and where it ends is unknown. And as I have no fortunes to spend in this direction, I will say to you good men, go home and do your part in this direction, not only for your own home, but for your neighbor, and may the influence of this Society in this direction be as traceable in coming years as the handwriting on the wall.

On motion, an earnest vote of thanks was tendered Miss Macy, for her interesting contribution.

FINAL RESOLUTIONS.

The following resolutions were reported by Rev. J. B. Schlichter:

Resolved, That the Kansas State Horticultural Society hereby expresses its sincere gratitude to the citizens of Wyandotte, for the unbounded hospitality so kindly extended to all the members of the Society during the sessions of this meeting.

That to the Union Pacific, Atchison, Topeka & Santa Fé, Missouri, Kansas & Texas, Kansas Central, Kansas City, Lawrence & Southwestern, Kansas City, Fort Scott & Gulf and Missouri Pacific Railways are tendered the thanks of the Society, for courtesies and liberal reductions in fare.

To the citizens of Kansas City, Kansas, for the free use of Alcott's Hall for the sessions, our thanks are expressed. And to Judge M. B. Newman, Secretary of the Wyandotte County Horticultural Society, and his associate workers, do we most gratefully acknowledge our obligations, for their constant and untiring devotion to the pleasure and comforts of all attending the meeting.

The members of the Kansas State Horticultural Society take pleasure in expressing their high gratification at the opportunity afforded them to meet in joint session with their brother horticulturists of the Missouri State and Missouri Valley Horticultural Societies, and express the hope that this may not be the last joint meeting of these kindred societies.

(Signed) Jos. Savage,
D. C. Hawthorne,
J. B. Schlichter,
Committee.

On motion, the report was adopted, and the Societies adjourned *sine die.*

APPENDIX.

REPORTS OF STANDING COMMITTEES, 1880.

THE STRUCTURE OF LEAVES.

BY J. W. ROBSON, CHEEVER.

The fluid which is so abundantly taken up by the roots of plants, and which is conveyed upwards along the interior of the stem, is very unfit for the nourishment of the plant, and for the supply of the growing parts, until it has been exposed to the influence of the air, by which great changes are effected in its structure.

The nutritious fluid of plants, like the blood in animals, needs to be exposed to the influence of the air to give it the power of maintaining life; and this cannot be effected either by the underground roots or by the hard woody stems and branches, which expose so small an amount of surface to the atmosphere. Nor can this be effected by the introduction of air into the internal cavities of these parts, since this would require a continued series of movements, as in air-breathing animals, which the plant has no means of performing. Again, as the plant is rooted in the earth, and is not adapted to move through the atmosphere, there is no reason why its surface should not be spread out to any extent, for the purpose of exposing the sap to the influence of the air. Further, a very essential condition of the changes which the sap undergoes by coming into contact with air, is the influence of *light*, without which they would be very imperfectly performed.

This general view of what is required from the leaves will suffice to show how beautifully their structure and position are adapted to the offices they have to perform. The leaf may be said to consist essentially of an extension of the skin of the plant into a flat, expanded surface, which is supported by a skeleton, prolonged from the wood of the stem or branch. If a leaf be carefully examined, it will be seen that from each surface a sort of skin may be torn, which may sometimes be stripped off very cleanly from the tissue beneath; the space between these surfaces being occupied by soft, green tissue, which the naked eye can often perceive to consist of separate particles, loosely united, but when examined with the microscope are composed of distinct cells, usually more closely packed together near the upper surface than near the lower, where are many cavities or interspaces among them.

The cuticle or skin of the leaves is furnished abundantly with *stomata* (mouths), by which watery vapor and gases can pass out, and air can enter; but these are chiefly, and often are entirely, confined to the lower surface. The woody skeleton of the leaf forms what is commonly known as the *mid-rib*, and the *ribs* proceeding from it. These *ribs* must not be confounded with similar parts in animals, since they do not in the least resemble them. They are principally composed of woody fiber, and of spiral vessels and ducts; and they proceed from the neighboring stem or branch, constituting the greater part of the *petiole*, or *foot-stalk* of the leaf, from which they afterward spread out.

This general account of the structure of the leaves of flowering plants will enable us to see how beautifully they are adapted — by the immense amount of surface they present, by its thinness and delicacy, by its numerous apertures, and by its expansion to the light of day — to the purpose they have to perform — the exposure of the crude sap to the air and sun, under the influence of which it is elaborated or digested, so as to become a highly-nutritious fluid.

There are few flowering plants on which the stem and branches are not at some part of the year clothed with these beautiful appendages, and the exceptions are chiefly in those forms in which the stem itself is so altered in structure as to be able to perform the functions of leaves. We have familiar examples of these exceptions in our prickly pear (*Opuntia vulgaris*), and *Mamillaria vivipara*, while tropical regions abound in species of the *Cactus* tribe. The stems of these, instead of being firm and woody, are comparatively soft and fleshy; their substance is moist, and composed almost entirely of cellular tissue; their surfaces are green, and covered with a distinct cuticle, which is furnished with *stomates;* and their form is often flattened so as to expose, like leaves, a large surface to the air. It is interesting to observe how completely the deficiency of one organ is here supplied by a modification of another.

A conformation somewhat similar may be observed in the common Butcher's Broom (*Ruscus aculeatus*), of Europe; the branches are flattened into a leaf-like form, and the flowers arise from the middle of their surface. In another foreign genus, *Xylophylla*, the flowers are placed around the edges of similar organs. A corresponding structure is exhibited by some of the Acacias of New Holland, which are sometimes so completely destitute of true leaves as to be termed leafless.

There are, however, some flowering plants which are destitute not only of leaves, but of all leaf-like surfaces. These grow by imbibing the juices of other more perfect plants, just as parasitic animals obtain their food by sucking the blood of others; and as the juices that afford them support have already been elaborated or digested by the plant from which they draw them, they have no need of leaves or any similar structure for the purpose.

Although there are few instances, then, in which leaves are absent in flowering plants, they are seldom found in Cryptogamia. In *Ferns* we always meet with them; and their general structure is much the same in all the points which are characteristic of leaves in general. The leaf is usually borne upon the leaf-stalk, which connects it with the stem; and it is at the bottom of the leaf-stalk the separation from the stem takes place, when the leaf falls off in autumn. The blade of the leaf is composed of the expanded ribs proceeding from the leaf-stalk, the interstices between being filled up with cellular tissue, and the whole covered with a thin skin. The mode in which these ribs are distributed is very characteristic of the principal divisions of the vegetable kingdom. Thus, in the Cryptogamia, wherever true woody ribs exist in the leaves, they are seen to divide and subdivide, each splitting into two branches like the prongs of a fork, at intervals; and in general these subdivisions do not unite again, hence they are termed *fork-ribbed.*

In the *Endogens* it will be observed that the ribs run in nearly a straight direction and almost parallel to each other; and that they have but little connection by the interlacement of their minor subdivisions, and if these be torn into ribbands, each ribband will have its own rib uniting with the mid-rib, and still the leaf will perform its functions nearly as well when thus subdivided, as when entire. Every corn field in Kansas will furnish us with examples; where the corn plant is exposed to the wind, its action splits the leaves up in this manner, and yet they do not appear to suffer. The banana and plantain of tropical climates are seldom seen in their native localities with their leaves entire.

In the *Exogens,* the form and mode of subdivision of the system of ribs, are extremely irregular; but there is a character common to all, by which the leaves of this group may be distinguished without much difficulty, from those of the others. There is usually a mid-rib or prolongation of the leaf-stalk along the center of the leaf, from which the smaller ribs arise; but sometimes the leaf-stalk subdivides into several subordinate ribs, which run from one extremity of the leaf to the other, but these secondary ribs, however they may be disposed, always give off a vast number of minute branches which ramify and unite with each other, so as to form a complete network; and thus it is, that the leaf of an *Exogen* can seldom be torn with any regular edge. This beautiful structure can easily be seen by removing the soft, fleshy portion of the leaves, preserving only the skeleton or minute network.

Leaves exhibit a wonderful variety, both in position, form, size and color; and these modifications are very useful to the botanist in classifying and analyzing unknown species. The relative position of the leaves, as whether alternate, opposite or verticilate, is a very important characteristic. The forms they assume are seemingly endless; and when made objects of study, fill the mind of the observer with wonder and amazement. Some of these forms are very interesting objects of study. The most remarkable are those termed pitcher plants. Our native *Saracenias* have a peculiar shape. The Chinese *Nepenthes* is of a very singular and complex construction. The monkey-cups of South America (*Cephalotus utricularis*) are not only curious, but wonderful in form. The Venus's Fly-trap (*Dionæa muscipula*), of South Carolina, and the Sundew of Great Britain (*Drosera rotundifolia*), are very curious modifications of the leaf. In regard to the size of leaves, in some species of plants they are nearly microscopic, while in other species the leaves become the wonders of the vegetable world. In the valley of the Amazon the *Pothos* family attract attention by the size and beauty of their large, thick-ribbed, arrow-shaped leaves, but even these are surpassed by the large water-plant, (*Victoria regia.*) The oval light-green leaves of this queen of aquatics measure six feet in diameter, and are surrounded by an elevated rim several inches high, exhibiting the bright carmine-red of the under surface But the wonderful luxuriance of tropical vegetation is very conspicuous in the foliage of the magnificent banana, (*Musa sapientum,*) and the plantain, (*Musa paradisiaca.*) A succulent stem, rising to the height of twenty feet, and frequently two feet in diameter, is formed of the sheath-like leaf-stalks rolled one over the other, and terminating in enormous light-green and glossy blades, fifteen feet long and two feet broad. And yet the leaves of some species of the palm exceed even these in size, and surpass all other plants in the grandeur and majesty of their mammoth proportions, single leaves attaining the length of forty feet, with a breadth of sixteen feet, arresting, as they always do, the attention of the most careless observer.

The great Creator has not only tinted the flowers with every imaginable color, but He has displayed His wondrous skill in painting the foliage of some species with the brightest hues. Some of the most remarkable are the leaves of the *Cissus*, *Gesnerias*, *Dracenas*, *Marantas* and *Crotons*, which are adorned with the most elegant colored foliage known to botanists. And here we must not forget the more popular foliage plants which are grown by every lover of flowers. We allude to the numerous varieties of *Achyranthus*, *Alternanthera*, *Coleus* and *Caladium*, the leaves of which, by the skill of the florist, are now bordered, margined, blotched and variegated in every conceivable form and tinted with the richest and brightest colors. And he can change the strains of color at his will as fashion demands.

In our report upon the *Root*, and its functions, we alluded to the fact that the roots of some plants had the power to produce wood-buds. So there are leaves possessed of the same power of developing buds from their edges. One of these is the Bog-Orchis, (*Malaxis paludosa,*) in which these buds can be clearly seen. The *Gloxina* is another example. We have raised large numbers of this beautiful exotic by simply pegging down a leaf on a pan of sand, and covering with a bell-glass. These in a few weeks would produce handsome, well-rooted plants. But a better example still is the *Bryophillum calycinum*, a native of the tropics, known in common parlance as the leaf-plant, from the circumstance that a single leaf, without either stem or roots, is able to maintain its life, and even to grow, produce plants and flowers, while hung up in a moist warm atmosphere, without the contact of soil with any part of it. The little buds which develop themselves from the edges of the leaves, become perfect plants before separating themselves from the parent leaf; when they have formed their own leaves and root-fibers, they can be detached, without injury to the young plants. We have a most familiar example in the plant growth of our State. The Walking Fern, (*Camptosorus shizophyllus,*) is a low, prostrate evergreen fern. Each frond is terminated by a long point which takes root at the end and produces a new plant; hence the name. In the State of Oregon, the *Tolmiea Menziesii* grows in moist, shady places. Its manner of propagating itself is very unusual among plants; buds are formed at the tops of the leaves, and soon develop into plants, and a large plant covered with these young ones gives the whole a very novel appearance.

Having thus noticed the chief varieties of leaves, as regards their external form, we shall consider very briefly their internal structure. The internal structure of a leaf cannot be well examined without a high magnifying power. And to do this, it is necessary to cut the leaf across with a sharp knife and then pare off an excessively thin slice from the cut edge; and this slice, being so thin, when placed under the microscope will permit the light to pass through it. The student will see a number of colorless cells on the upper and under cuticles of the leaf. Between these are seen a large number of shaded cells, forming the fleshy portion of the leaf. These are arranged with considerable regularity, and are packed very closely together beneath the upper surface, and there are scarcely any spaces between them in that part. Below, however, it is seen that the cells are of less regular form, and that they do not come into such close contact, so that there are spaces among them; these, communicating freely with each other, form what are termed the intercellular passages and spaces of the leaf.

The *stomates* (or mouths) are chiefly to be found in the lower surface, and they always open into the vacant spaces beneath the cuticle and not against the cells in contact with it. It is the large proportion of these vacant spaces which usually contain a considerable quantity of air, that occasions the color of the under side of the leaf to be usually much lighter than that of the upper. Nearly all the leaves which assume the ordinary position, having one surface directed upwards and the other downwards, closely correspond with the one just adduced as an example in their general structure.

No natural extremes of heat and cold seem to put an entire check upon leaf growth. Even in the desert plains of the torrid zone, and along the snow line of the highest mountains, the eye of the traveler is often refreshed by the appearance of a few hardy plants, which find sufficient materials for their growth in these desolate regions. And wherever a spring of water, bubbling up in the arid desert, moistens the soil and atmosphere around, a spot of luxuriant verdure is found. These *oases* are the stations at which caravans halt, when crossing the extensive wastes of parching sand; and although their effect upon the mind is doubtless heightened by the dreariness of the preceding journey, there is no question that few spots can present greater richness of leaf growth than these. It will be seen, therefore, that heat, light and moisture form the circumstances most favorable to plant growth, and it is from the combination of the latter of these conditions with the former, that the vegetation of those small islands in the tropical ocean is so peculiarly grand and rich, causing them not only to resemble, but to excel in beauty, those oases which are indeed islands in a sea of sand; and nothing can be a greater contrast with the desolation around, than the "green pastures and still waters" which they afford.

FUNCTION OF THE LEAVES.

BY J. W. ROBSON, CHEEVER.

If the leaves of a peach tree are stripped off, the fruit amounts to nothing. This fact was exemplified twice during the last decade by the grasshopper invasion of that period. When the leaves of the grape or the gooseberry have been devoured by caterpillars, the fruit remains small and sour, and entirely worthless for the food of man. If any healthy tree be persistently defoliated during the growing season, the tree will die. These facts led early botanists to form the opinion that leaves were merely "a clothing, or a protection against colds and heats." Though this ancient theory is certainly true to a certain extent, still it is only a very small portion of the functions of leaves. For it is in the leaves that those changes are effected by which the juices of the plant, relieved from the water—which is unnecessary for the functions of life—are rendered fitting for the nourishment of the plant. By the process called *exhalation*, a large amount of water vapor is given off under favorable circumstances from the surface of the leaves, as from the pores of the skin of a man.

A few simple experiments will show that there is a strong probability that this rapid transpiration takes place through the *stomata* (or mouths) of the leaves. If a piece of glass be held over the *upper* surface of the leaf of a grape-vine actively growing in a hot-house, little effect will be produced upon it; but if it be held close to the *under* surface, the glass will soon be dimmed by the vapor, and in a short time longer this will accumulate so as to form drops of water. As the upper surface of the vine leaf is nearly destitute of stomates, whilst the lower is thickly covered with them, the disproportion in these effects is at once explained, if the transpiration really takes place through these apertures. Again, if a plant actively transpiring under the influence of sunlight be carried into a dark room, its transpiration is immediately checked, and if its stomates be examined, they will be found to have closed. Thus it appears that the rapid loss of fluid from the whole vegetable surface, but especially from the leaves, which constitute a most important part of the economy of the living plant, is regulated by the number of *stomates* which each part contains, and by the degree in which light acts upon them.

That leaves exhale moisture is proved also by the simple experiment of gathering the leafy branch of a tree, and immediately stopping the wound at its base with wax, or some other fit substance, to prevent the effusion of moisture in that direction. In a very short time, the leaves droop, wither, and fade. If the branch in this condition be placed in a very damp cellar, or immersed in water, the leaves revive and assume their original appearance; this experiment also shows their power of absorption. A common-sized cabbage, in the twelve hours of daylight, was ascertained by Hales (one of the best experimenters on this interesting subject) to exhale from 15 to 25 ounces daily, according to the light and warmth to which it was exposed. The transpiration of a sunflower in full growth, during fifteen days and nights, was carefully observed by Hales. This plant was 3½ feet high, its weight 3 pounds, and the surface of its leaves was estimated at 5,616 square inches. The average transpiration during the whole period was found to be 20 ounces per day; but in one warm, dry day, it was as much as 30 ounces. The Cornelian cherry is most remarkable in this respect; the quantity of fluid which was evaporated from its leaves, in the course of twenty-four hours, is said to be nearly equal to twice the weight of the whole shrub. The *exhalation* of aquatic plants is remarkably copious; they grow constantly immersed in water. Their leaves are peculiarly vascular, and dry very quickly in the air, withering rapidly after exposure to it. Other aquatics float with only the upper surface of their leaves exposed to the air, which surface is so contrived, that water will not remain upon it. These leaves, though extremely juicy, dry with great rapidity, as does every part of the plant, when gathered. It is probable that they imbibe copiously by their under sides, and perspire by their upper.

Some species of plants exhale so rapidly at sunrise, when the heat of the air is not sufficient to enable it to carry off the disengaged moisture, that the fluid accumulates in drops at the points of the leaves, and has been mistaken for dew. This, however, is not the case, since it has been observed on plants under glass, as well as on those that are exposed; and it has been noticed also at other parts of the day. A similar accumulation of water in drops has been observed when plants have been influenced by an electric current. It is perhaps in this manner that an electric state of atmosphere hastens the growth of some kinds of plants.

Applying these theories to practice, we learn from them that the operation of transplanting trees and shrubs should not be performed in the hot summer months when the *exhalation* is most active, and that it is better to make the change in autumn or early spring when they are nearly destitute of leaves, and therefore scarcely exhale at all. We also learn that forests do keep the surrounding atmosphere in moist condition by the exhalation of the foliage.

The roots of many forest trees penetrate to the depth of ten to twenty feet or more in search of water, pushing downward till they find it. It is not necessary for the tree to send its roots to the water-bearing layers for moisture, for the soil is kept more or less moist through capillary attraction, by which the water is made to rise slowly to the surface, there to evaporate. The quantity of water thus restored to the atmosphere is known to be quite large, even from tracts barren of vegetation. But trees very much hasten this process, as they are able by their descending roots to approach very near, if not penetrate, the water-bearing strata. Met, or arrested by the roots, the water is drawn by *endosmose*, through root, stem and branch to the leaves, from whence it passes into the atmosphere. Hales, by his experiment already noted, showed that a sunflower plant a little over three feet high and with about forty square feet in leaf surface, was able to exhale nearly two pints of water per day. But a large elm possesses nearly 200,000 square feet of area in foliage. Assuming that the exhalation from each square foot of surface in the elm is two-thirds as rapid as from the same in the sunflower, over 1,000 barrels of water would be poured into the atmosphere by the tree during each season of active growth. Multiply this amount by the number of trees in a forest, add to the product the quantity of water exhaled by shrubs and herbs, and we gain some idea of the vast quantity of moisture saved to the horticulturist by the forest vegetation.

The moisture thus evaporated from the foliage of forest trees unquestionably increases the annual rainfall, as one of the essential conditions of precipitation — a cool and moist atmosphere — is thus supplied. All have noticed how rain clouds follow the larger streams, *i. e.*, a cool moist, belt of air, after a drouth in summer, avoiding the hot, dry areas, till the air over them is rendered somewhat moist and cool by evaporation from the river valleys. The above conclusions indicate (if correct) that a forest may be as valuable as a river in inducing rain, and that the destruction of one is equivalent to drying the fountains and tributaries that supply a river with water.

Although the leaves of the higher tribes of plants are without doubt the special organs of exhalation, they also have the power, like the leafy surfaces of the lower tribes, of supplying fluid nourishment, when the system requires it.

We have already shown in former reports, that it is only as we ascend the scale of vegetable life, that we begin to meet with distinct roots for the purpose of absorption. And even where distinct root-fibers are developed, they are often closely connected with the leafy surface. It is not to be wondered at, then, that the leaves of the higher plants should be capable of supplying the function of the roots; when these are absent or imperfect, or are unable, from the nature of the soil which surrounds them, to obtain a sufficient supply of fluid nourishment, not unfrequently the roots, where they exist serve merely to fix the plant, finding their way into the crevices of the hard dry soil, or of the barren rock, on which it grows, and then it must be altogether dependent upon the moisture it absorbs through the leaves. It is wonderful to see the precipitous faces of rocks apparently the most barren, studded here and there with plants of the *Cactus* tribes, exciting attention by the brilliancy of their blossoms; while the *Orchideæ* spread themselves over the surface of lofty trees, from which their roots hang down like fringes, suspended in the air.

A fact familiar to everyone who has bestowed common notice on the processes of vegetable life, proves that the leaves are capable of absorption. When plants are faded by the intense action of light and heat, and have suffered from deficiency of water, they will revive rapidly when their leaf surfaces are moistened, even if no fluid has been supplied to the roots. If the leaves of the white mulberry are placed with their upper side in water, they will fade in a few days, while if others be placed with their lower side in water, they will remain fresh for months; indeed nearly all the leaves of trees and shrubs retain their verdure longest when the lower side is placed in contact with water, while the leaves of herbaceous plants absorb more readily by their upper surface. We thus learn if we desire to revive drooping plants or trees by the application of moisture, we must water the herbaceous plants from above, and if they be shrubs or trees, the water should be thrown up by a syringe from below.

The absorption of fluid food by the foliage was known long ago to the British horticulturist, and put to practical use in the cultivation of the grape and other fruits — under glass in their forcing houses — by the use of liquid manure made from sheep-droppings, impregnated with carbon, ammonia and potassium. With this liquid in a clear state, they syringe the under side of the leaves of their vines, from the time the fruit is set till the berries begin to color. This culture, in conjunction with borders for the roots, (in which the phosphates are freely used,) enables the grape culturists of that country to produce those mammoth clusters which have so often excited the surprise of horticulturists of other countries. We have often seen bunches of Muscat grapes weighing seven pounds, Black Hamburg ten pounds, and White Syrian and Cochin China grapes twenty-five pounds in weight. Large figs and peaches are obtained by the same process; and those huge gooseberries raised by the Lancashire growers are obtained by what they term "suckling" the leaves and the fruit.

Another function which leaves perform is, their ability to present their upper surface to the *light*. This agency has a powerful effect upon the foliage of plants. For instance, it gives the green color which they present to the eye. Light also acts beneficially upon the upper surface of leaves, and injuriously upon the under side; hence the former is always turned towards the light, in whatever situation the plant may happen to be placed. Plants in a hot-house or in a window present the front of their leaves to the side where there is most light—never to the point where most air is admitted, or to the furnace or register, in search of heat. A great number of leaves even follow the sun in its course. A clover field is a familiar example of this.

The most important function, however, that leaves perform, results from their taking up carbonic acid from the air and soil. The chemical actions of light, heat and the component parts of the atmospheric air upon leaves, are now tolerably well understood. It is agreed that in the day-time leaves imbibe from the atmosphere carbonic acid gas, that they decompose it, absorb the carbon, as a matter of nourishment, and emit the oxygen. The burning of a candle or the breathing of animals in a confined space produces so much of this gas that neither of these operations can go beyond a certain limit; but the air so contaminated serves as food for vegetables, the leaves of which, assisted by light, restore the oxygen, or, in other words, purify the air again. This beautiful fact shows a mutual dependence of the animal and vegetable kingdoms, and adds another to the many proofs we have of the wisdom and wonder-working power of the Creator of all things. And yet man in his ignorance and his thirst for worldly gain, has done his utmost to destroy this beautiful and harmonious plan; for evidently it was the intention of the Creator that animal and vegetable life should everywhere exist together, so that the baneful influence which the former is constantly exercising upon the air, whose purity is so essential to its maintenance, should be counteracted by the latter.

In the darkness of the night leaves give out carbon, and absorb oxygen; but the proportion of the latter is small, compared with the amount that they exhale by day, and must likewise be the proportion of carbon given out, else the quantity of the latter added to their bulk would be very trifling.

There can be no question of the general purpose answered to the vegetable constitution by these functions of leaves; but when we attempt to explain how the peculiar secretions of different species and tribes of plants are formed, how the same soil, the same atmosphere, should, in the leaf of the grape-vine or sorrel, produce a wholesome acid, and in that of a *Spirrge*, or *Manchineel* tree, a violent poison — how sweet and nutritious herbage should grow among the acrid Crowfoot and Aconite — we find ourselves totally unable to comprehend the existence of such wonderful powers in so small, and, seemingly, simple an organ as the leaf of a plant. The agency of the vital principle alone can account for these wonders; though it cannot, to our understandings, explain them. The thickest veil covers the whole of these processes, and so far have physiologists hitherto been from removing this veil, that they have not even been able to approach it. All these operations, indeed, are evidently chemical decompositions and combinations; but we neither know what these decompositions and combinations are, nor the instruments by which they take place, nor the agents by which they are regulated. How humble a student ought to feel when rising from the contemplation of a simple leaf, or blade of grass, when he considers that within their beautiful forms they hold mysteries which he cannot unravel.

A vain-glorious French naturalist caused the following inscription to be cut on his own statue: "A genius equal to the majesty of nature." But the function of the tiniest leaf was sufficient to confound his pretensions.

SMALL FRUITS.

BY E. A. COLEMAN, LAWRENCE.

Mr. President, Ladies and Gentlemen of the Kansas State Horticultural Society: In presenting this report as chairman of the Committee on Small Fruits for the past year, I propose to take a retrospective view as far as I have any knowledge from others, as well as to give to you my own experience and experiments upon growing small fruits on my own grounds, with the different varieties and modes of culture; and in doing so, I beg your patient indulgence, even though I may differ world-wide with the members of this Society.

Small-fruit growers, like every other profession, when starting out, without experience in growing fruit of any kind, not knowing even the first principle of the art and science, have high anticipations of certain success. The result in nine cases out of every ten is naught but disappointment. The consequence is, that they let every effort that has been made go by the board, and give up in despair, which I think no man or woman can afford to do in a fruit country like this, where a little knowledge and experience will put upon their tables, from the first of May until the middle of August, the most luscious fruits that are grown in any part of the world.

The art of small-fruit growing can only be acquired by close attention and observation, as well as diligence and perseverance. Very many think all they have to do is to set out a few vines and they will have fruit without cultivating or looking after them from the time they are set out until the fruit season rolls round, when, to their disappointment, they find they have none. The weeds have overgrown them and sapped all the moisture from the earth that the plant needed to sustain its life, and the plant is dead. Then, on being asked about their fruit, they tell you that their location was a bad one, that their vines had done no good; while another man will say that he made a bad selection as to varieties. The real facts are, their location and varieties are identical with their neighbor's, who has gathered an abundant crop.. It is true that location has much to do with the success of a plat of small fruits, for without a proper location there can be no hope of success. The same is true as to varieties. And yet we may have both good varieties and location and not succeed, from neglect or want of proper cultivation. Every kind of fruit requires an exact condition of soil and location to produce the same results, so far as my experience has been, and small fruits are no exception to the general rule. It is a well-known fact that out of hundreds who have attempted to grow small fruits in Kansas, not one in ten has succeeded, and the reason that most of these men have had to give for the failure was, Kansas was not a fruit country. But after this year's crop of fruit in Kansas, both large and small, I think those persons will have to own up and say that fruit can be grown in any given quantity in Kansas, and that it is their own fault that they have not succeeded.

STRAWBERRIES

Have done remarkably well in Douglas county the past year where they had anything like proper care, although the season was rather dry at the time of their ripening. The Wilson and Charles Downing took the lead so far as I had an opportunity to know. I believe, to raise the strawberry successfully they should be planted in a rich clay soil in the spring of the year, and kept well cultivated all summer, and before hard freezing sets in should be well covered with old hay or straw. Hay is the best.

GOOSEBERRIES.

The gooseberry crop was large and berries fine where they had been worked on the renewal system — cutting out all of the old wood that is two years old. The American Seedling is the only variety that I know of worthy of cultivation. Kept well muched with old hay, they produce good crops for an indefinite number of years.

BLACKBERRIES.

The blackberry crop was unusually large in most localities, although I know of one or two plantations that were almost ruined by the rust. The only remedy so far known for this disease is, as fast as the canes become affected, cut out and burn, as by letting them stand the healthy ones become affected.

There seem to be but two varieties of blackberries that are cultivated to any considerable extent in Douglas county with profit. These are the Lawton and Kittatinny. And with these there seems to be quite a diversity of opinion which one should be recommended. I have grown both for the last ten years, and would not be without either, as the Lawton is by far the best for shipping, being much the firmer berry; in fact, it turns black at least one day before it is ripe. But for home market the Kittatinny is preferred, as it is always sweet when black.

In planting blackberries, the rows should be at least six feet apart, and plants two feet in the row; to keep down the sprouts and weeds, maintain a heavy mulch between the rows, and if you want extra-large berries, put at least a shovelful of manure to each hill. When the canes have grown two or three feet high, they should be nipped off; that will cause them to throw out laterals; and when these are a foot long, cut them off, thereby forming a complete tree.

CURRANTS,

I hardly think, will ever be raised to any considerable extent in this country, as the plant needs a great deal of moisture; and in this hot, dry climate they have not been a success, except where they have been planted behind some fence or in an orchard, where they have been kept from the burning sun in midsummer. My judgment is, if any one will go to the trouble I have named above, they can have plenty of currants for family use.

RASPBERRIES.

The raspberry crop has been most abundant the past season where it has had anything like care, but in my locality not one-half of the acreage that was in raspberries gave the owners anything like a reasonable return for the time and money expended. The reason to me is obvious. I do not think that one man in ten who plants raspberries has an idea of their nature or their wants. My reason for thinking so is, that of all the planters of the raspberry in the State that I know, not more than two have made it a success. I see plenty of raspberries in market; but as for seeing good, large, fat raspberries, as large as the end of a man's thumb, instead, you will see plenty of little, half-dried and half-ripe ones, not larger than the nail on your little finger, that are no more fit to eat than so much gravel mixed with corn meal. Why is it that so many fail to grow the blackcap raspberry to perfection? It cannot be on account of location, because the raspberry is at home all over Kansas. I have gathered splendid berries all the way from Fort Gibson to the Colorado line. Some will tell you that their vines winter-kill. Many times they are found dead, root and branch, and they really think that it was the winter that killed them. And why should they think otherwise? They did not see one of their vines from the time they picked their last quart of berries, until they discovered the next spring that they were minus leaves. Perhaps one-half or two-thirds the way down the vines were dead, and, in many instances, to the ground. The mistake they make is, that instead of winter-killed, they were summer-killed. I presume nearly every raspberry grower in this house will say that this is not correct; they will tell you they know their vines winter-killed; very many say so because their father did. But, gentlemen, I am not here at this late day to make any statements before the members of this Society, that I cannot prove to the satisfaction of any reasonable man. I have said that raspberries did not winter-kill. As a proof of what I say, here are two varieties of raspberries that were cut the third day of last October, before there had even been a frost to kill tomato vines. These vines I offer as proof of my theory, that they summer-kill instead of winter-kill. Mr. President, whether I am right or wrong in my theory of vines killing, one thing is certain: my vines have never winter-killed. I doctor for summer-kill. And further, I have been successful in growing raspberries, having marketed over $400 worth of blackcaps this year; and if any man will come up and say as much, I will throw up the sponge. And what is more, I am going to raise as many next year. Says one, "How do you know that?" Because my vines did not summer-kill, except a few on the edges where we were careless and did not attend to them as we should.

MODE OF SETTING OUT, AND CULTIVATION.

First, pulverize the ground as it should be for wheat or corn, and with a twelve-inch plow lay off the rows, eight feet apart, leaving a furrow about six inches deep; drop the plants at the bottom of the furrow two feet apart in the row, and cover the roots perhaps one inch thick with dirt. Says one, "What do you want to put your plants away down there for?" I answer, to prevent being obliged to set a new plantation every three years. I have a patch which I put out twelve years ago, in as good condition for a crop next year as those that have been set out but three years. Cultivate the first year the same as corn; pinch all stalks back when about two feet high; and, as a rule, I get about half a crop the first year from setting. Cultivate as though there were no fruit on the vines. The second year pinch back the end of the canes to the height of about two feet and a half. As soon as that is done the laterals start and grow with great vigor, and they should be nipped when they are not over a foot long. If neglected until two or three feet, you had better not prune until the next spring; for if they are cut back after the time I have stated, they will throw out small, dwarfish laterals like these, and if they produce fruit at all, it will be small—not fit for market. Being so near the extremities, they are very apt to dry up and not ripen. When my plat is once in bearing, I continue cultivating until the fruit so hangs over into the rows that it would be injured. As soon as the crop is off, commence cultivation to keep the plants from summer-killing; for if the land is allowed to bake and crack, as it surely will do where it has been tramped hard in taking off the crop, the small fibrous roots will not grow large enough or long enough to reach down to moisture. The consequence is, they dry up and the stalk dies. The fruit-man, as I said before, did not see the condition of his plants at the close of summer, but in the spring he finds they are dead, and of course the winter killed them. In manuring, take a wagon-load of good manure, let the team straddle the row, and put from one to three shovelfuls to a hill, according to the number of canes there are in the hill. Always let all the canes grow that come up, and stimulate accordingly. The varieties that I cultivate for market are: Doolittle, for early, and Miami and Smith, for later. The latest variety is the McCormick, it being from four to six days later than the Smith and Miami. For family use, the Seneca is the best.

The Turner raspberry is a red variety, that bids fair to be very productive as well as very hardy. I have grown it but two years, and therefore can say but little about it. I tried manuring one row last year, and, as a result, the berries were at least twice the size of those that had not been manured.

I will submit for your consideration these hasty and imperfect remarks, hoping that you will investigate the subject of small-fruit growing more fully, that all may be benefited.

PLANTING AND TAKING CARE OF GRAFTS.

BY F. WELLHOUSE, FAIRMOUNT.

The last report of your Committee on Orchard Culture was devoted to the subject of root grafting, and we will confine the present report to the planting and taking care of the grafts in the nursery. Our last report left the grafts tied up in bunches containing fifty in a bunch, and packed in boxes in the cellar.

Now in the spring, as soon as the ground is settled and all danger of freezing is over, say about the first of April, they should be set into the nursery, but be careful that the freezing *is* over, because if the ground should freeze an inch or two deep after the grafts are set out, it will lift the grafts out of the roots and ruin them.

Select for the nursery as clean a piece of ground as you have, and as clean of weeds as possible. Newly-broken rolling prairie, cultivated in potatoes the year previous, has given us the best results, as it leaves the ground mellow and in fine condition to receive the grafts.

Another good way, where you are crowded for time, is to break up the prairie in May or June; in the fall cross-plow it, running the plow eight or ten inches deep; then in the spring, just before planting, plow again. Old ground will do, but it is usually more weedy, is harder to pulverize, not as fresh and strong, and is more liable to have trash in it. If old ground is used, rake all the trash off with a horse-rake, and give it a good plowing in the fall; this fall plowing should be done early so the weed seeds will sprout and be winter-killed. Having the ground well pulverized and in good condition is very essential, and fall plowing helps very much.

Having selected the site for the nursery, and the ground in good condition by cultivating the year previous, and everything ready in the spring, at the proper time take a good stout team, (three horses with riding-plow is best,) mark out the land, and back-furrow so as not to turn on the plowed ground, and plow deep.

When the land is plowed, run over it with a harrow once or twice and level it up and pulverize the surface clods. Having all this done, we are ready to commence setting out the grafts.

The usual way of doing this is as follows: Take a quarter-inch cord or rope, the length of the intended nursery rows; fasten each end to a four-foot stake; now stretch the cord where you want the first row, and drive the stakes firmly in the ground; take a transplanting trowel in the right hand, and commence at the end of the row, within about two inches of the line, and push the trowel into the earth to the required depth, leaving the top from you, and then pull the top back toward you; with the left hand insert a graft behind the trowel, pushing it down so that one bud is above ground, holding it until the trowel is withdrawn; press the earth firmly around the graft; then insert the trowel again, six or eight inches ahead, and put in another graft, and so on, keeping about two inches from the line. When you get through to the other end, pull up the stakes, move them in four feet, stretch the line, and set the stakes, and you are ready for another row.

When one variety is all planted, drive a stake, made of some durable timber, at the end of the kind just planted, with the number or name cut, printed or written on it; or, what is better, arrange the grafts so there will be full rows of each variety; when there is more than one kind in a row, and the stake gets pulled up, it sometimes creates confusion. You should keep a book with you, and when a row is set, put down in your book the name of the variety, and the number of the row, so that if the stake gets moved, you will know the variety contained in the row.

Another good way to plant grafts, and practiced by some, is to take a spade, and with your foot push it into the ground, where you want the graft, with the handle leaning towards you; then push the handle from you; let a boy set a graft behind the spade; pull out the spade, and push it in again six or eight inches towards you, and have the boy insert another graft, and so on; in this way, when you push the spade forward to receive the graft, it presses the earth to the former graft.

With this mode of planting, an ordinary farm hand, with a boy, will set out four to five thousand a day; with the trowel, one expert will set out five thousand a day, but ordinary hands do not average over two thousand.

For the last five years we have set out our grafts in the following manner, and we have had excellent success with them: We set the stakes within two feet from where we want the first row of grafts. Then take a common two-horse corn-planter, and take off the wheels and all the gearing except the runners; hitch a good, steady team to these runners, and straddle the row of stakes and drive through to the other end, keeping the tongue on a line with the stakes; then set the row of stakes in eight feet, and drive back, marking two rows again, thus marking off the ground with the runners just as we would for corn. The driver should stand or sit on the runners, so as to hold them to the ground, and a man with a good eye and steady team can mark the rows as straight as a line. The runners should be set so as to run just the depth that the grafts should be set. As these runners pass through the ground they cut a crevice wide and deep enough to receive the graft. After they pass, the fine earth falls in behind, but is so loose that we can push the graft down through it without any trouble.

Take a bunch of the grafts in the left hand, and with the thumb and forefinger of the right hand pick a graft from the bundle, taking hold just above where the graft leaves the root, and push it gently into the crevice to the depth required, at the same time walking with one foot on each side of the crevice, thereby tramping the earth firmly around the grafts. Where we have large amounts to set out, we get five or six hands (grown boys and young men with nimble fingers are best), and let them simply set the grafts into the crevice, and we follow after and tramp the earth to them, and see that they are put in right. In this way we have been able to average ten thousand to the hand, with common, unskilled labor; and grafts set out in this way have given us better results than any other way we have tried. They are put in at a uniform depth, and regular distances apart, and do not seem to be injured in planting as with the spade or trowel. We prefer to have the rows run north and south, as we think the sun gets to all sides better; but where the ground is not suitable, we should not hesitate to run them east and west. Grafts set six to eight inches in the row, and the rows four feet apart, will contain nearly 20,000 to the acre.

In about a week after the grafts are set, cultivate with a double-shovel plow or one-horse cultivator, and repeat this at least once a week, running as close as you can without disturbing the grafts. When weeds appear in the rows, clean them out with a hoe. Thorough culture the first year is absolutely necessary.

At the end of the first year, with a fair season and good culture, the grafts, or yearlings as we call them now, should be two to three feet high.

In the spring of the second year they should be trimmed up to one straight shoot, and again in July the body should be stripped of all shoots up to where you want to form the top; allow no forks in the top; train one upright, leading shoot in the center, with side-branches at proper distances.

The cultivation the second year will be much easier than the first, and can be done best with an eight-inch diamond plow, first throwing the furrow to the trees, then from them; and if they are plowed often enough, but little or no hoeing will be needed. Cultivation should cease this year by the middle of July, so as to give the wood time to ripen well before winter.

At the end of the second year, if properly cared for, the trees should be four to six feet high, with a well-formed top, and the largest are of suitable size for transplanting into the orchard.

The third year the bodies should be kept clear of shoots, up to the limbs, and cultivate the same as second year. At the end of the third year the trees should all be transplanted to the orchard.

Keep enough traps set around the nursery every winter to catch all the rabbits.

MARKETING FRUITS.

(Essay prepared by P. M. Kiely, of St. Louis, for the Missouri State Horticultural Society. Published by permission.—SEC'Y.)

The subject of marketing fruits is an important one to fruit growers, and as the business of fruit growing is steadily expanding to meet the growing wants throughout the country, the subject continues to grow in importance. Fruit growing is eminently a legitimate calling, and forms an important factor in the development of the resources of the country, and since it is not fostered or encouraged by subsidies or other inducements with which other enterprises have been favored, the fruit grower is thrown entirely upon his own resources. Next in interest, then, to the production of his goods, becomes the subject before us, how to dispose of his products to the best advantage. This subject has been handled in an able way before your Society heretofore, usually by the grower or shipper, but in this instance it is the seller or commission man who addresses you, and the subject will be reviewed from his standpoint; but the aim throughout will be to impart some useful information, and if we wander from the subject it will be to reach after such items as may prove of interest to the grower.

From an experience in this capacity dating back to 1866, in the St. Louis market, I gather the few facts and suggestions I offer in this communication. I may remark here that the seller is sometimes censured by the shipper for sales of fruit that do not appear satisfactory, while at the same time the shipper may be most to blame in the matter for the poor returns—and necessary explanations are not made. The fruit season is short and hurried, and your commission man, who has perhaps from fifty to one hundred shippers to serve each day, finds it impossible to write the number of explanatory letters that are often essential to reach a proper understanding between both parties. It must be admitted that the writing of such letters would often prove quite beneficial, for it would lead to pleasanter business relations and establish a confidence that does not always exist. The first duty of your commission merchant and his assistants is to dispose of your fruit to the best advantage, and if any time remains for suggestions or explanations in connection therewith before mailing your returns, it is taken advantage of for the purpose indicated.

It is not the amount of fruit you grow and ship that represents success, but what you realize from what you handle. It is not an uncommon thing to find a man with five acres of strawberries, for instance, making more money than his neighbor acquires from ten acres. Therefore, it is quality rather than quantity that indicates success in fruit growing. It should be borne in mind that there is just the same expense attached to marketing an inferior crop of fruit that there is in putting a crop of choice fruit in the market. The gathering, packing, hauling, box material, express charges and other expenses are just the same on your inferior as on the finer fruits. But this is not all. Your commission man has to devote much more of his time trying to get rid of it, and you usually have to wait longer for returns. Thus the seller shares in some of the unpleasant and unprofitable results arising from shipping poor fruits as well as the grower, and the express company is the only party handling it who finds no fault, for whether good or bad, the good, round fees are exacted.

From these facts we can see the great disadvantages under which a shipper of poor fruit labors, and how difficult it is for him to find the business profitable. The fruit grower must take the same view of his calling that other men in other channels of trade do, and he can reach success as they do, through the excellence of their wares, putting that before the public that commands patronage by reason of its merits, practicing no deception. Men whose goods have a national reputation, that find buyers in every market, acquired distinction in this way. Every commission house has a number of shippers (a limited one, however) whose brands or names are well known to his patrons. These are first sought, and though the highest price is placed on them, they are the first to disappear. It is not necessary to open every package of such goods to sell, one sufficing, as the fruit is uniform and the packing straight. The early morning's market, say 6 to 8 o'clock, is always the best time to sell to advantage, and it is, therefore, the duty of shippers to take advantage of such facilities as exist, to place their fruit on the morning's market. The nights being cooler, the fruit suffers less while in transit during the night, and should always, whenever practicable, be taken advantage of. The proper time at which to gather fruit to stand certain distances is an important consideration. Indeed, it appears to be a feature that is, in a measure, ignored, or poorly understood. The fruit gathered for a fifty-mile ride should be gathered when at a much more advanced stage than that which is expected to endure a two-hundred-mile ride, and reach the market in a presentable condition. To gather the fruit at just the proper time, under these circumstances, is perhaps quite an art. Neat, uniform packages have much to do with selling the fruit, for the sale of fine fruit is usually spoiled when coarse or unbecoming packages surround it. The picking and packing of fruit has been fully written up heretofore, and I shall not devote much space to it or dwell upon it, for it is generally understood among growers. We will then consider the

STRAWBERRY,

The first fruit of the season. It comes to us with the genial, fragrant atmosphere of spring, with the warm sunshine, and to thousands they are as welcome as the flowers in May. It has its admirers and purchasers among all classes. The invalid sighs for it, and the hale and hearty greet it with a smile, while the purse opens to it more readily than to any other fruit. It holds possession of the market, and remains undisturbed by rivalry for quite a period. Our country affords such a variety of soil and climate, that there is an abundance of strawberries on our market for nearly four months. Commencing with the first regular receipts, about the first of April, from Texas, Louisiana and Alabama, they continue steadily, until northern Illinois, or Racine, Wis., winds up the season. Texas' first shipments, a few seasons back, when railroad communications enabled her to reach our market, arrived in a condition far from inviting, the fruit ranging from very green to very ripe. The packing showed the inexperienced hands engaged in it, and fence planks did service as crates. The express charges, exorbitant in themselves, were doubly so when the wood far outweighed the fruit. The growers there since then have progressed rapidly in all respects; but very little of their fruits will come this far, however, as markets much nearer home offer good prices.

The number of varieties now cultivated form an extensive list. To go into details discussing their merits or demerits would involve too much space and time, and may after all elicit little new. I will say, however, that in my experience I have seen nothing yet that approaches the Wilson, and for all the great commercial wants it certainly stands unrivaled. It has stood the test everywhere, and in sections like southern Illinois, where the most experienced growers reside, we find the Wilson nearly the sole occupant of every field. Larger and finer-flavored varieties you have, which are adapted to certain wants, those of your own home and vicinity, and within their prescribed limits they will prove more acceptable than the Wilson; but to go into distant markets and other States, and do it successfully, you must rely on the Wilson's Albany. Most of the money made from growing strawberries has been made off this variety, and it is likely to retain the high position it occupies for years to come.

The six-gallon case and the Leslie or octagon quart box find the most favor with buyers, and there seems to be no desire for a change. The four-gallon case with square quart box appear in our market late in the season from Michigan and northern Illinois, but the measure in the square box is generally considered less than that of the long box. Topping off, or placing on top of the boxes the largest berries, is unfortunately a practice that is too prevalent. Neither would I suggest putting them in the bottom of the box, for if none appear on the surface, the presumption is that there are none in the box. There should be no attempt to deceive in packing. The packing that approaches nearest to perfection, is that coming to us from southern Illinois.

Every package has stenciled on it the name of the grower, and he wisely feels that he cannot afford to put his address on a package that is put up to deceive. As soon as all growers arrive at this conclusion, no more strictures of this character will be necessary. The same remarks will apply to the packing of all other fruits. It is a notorious fact that "crooked" packing, whether practiced in putting up berries or the larger fruits, spoils the sale of the whole lot. The attempt to deceive and defraud is evident, and when a sale is effected that sticks, it must be at figures below the actual value of the fruit. Your commission man has not the time to re-pack, and must sell the goods as he finds them. There is nothing smart or profitable in this style of packing. It deceives nobody, or at least not more than once, and the brand will be avoided thereafter.

CHERRIES

Appear next on the market. The territory tributary to this market is not raising many cherries at present, judging from the amount received in this market the past two or three seasons. The sour or tart varieties will prove the most profitable to parties not near leading markets. The fancy varieties are too perishable in their nature, and cannot be re-shipped successfully, and must be sold at once on reaching your nearest market. In shipping, use the same package you would for strawberries, though small baskets could also be used to advantage. In filling the quart boxes, be sure to shake them. If you do not, they will undergo considerable shaking while in transit and reach their destination about half full, for the stems of the fruit, which must remain attached, fill the box more rapidly than the fruit itself. Put in no soft, injured or over-ripe fruit.

PLUMS.

If there are any choice varieties of plums grown by parties patronizing St. Louis, the curculio must be the consumer, for very few of them reach any dealer. The Damson, Chickasaw and Wild Goose embrace nearly all that is offered, and a steadily-increasing demand exists for each, especially for the Damson, which commands a price that should insure more liberal cultivation. The usual price is $2 to $2.50 per bushel. It can be safely shipped a thousand miles by express, if not picked too ripe, and reach its destination in prime condition. Missouri, Illinois and Indiana are our principal sources of supply. This State supplies an abundance of the Chickasaw plum, while the Wild Goose flourishes a little further south. Arkansas grows the finest specimens coming to market, and the growers there find it more profitable than any fruit they can grow. The bulk of the receipts sold last season at $1 to $1.50 per box, one-third bushel, which is the package generally used. The six-gallon case, with quart boxes, are used to good advantage, also, when on the road longer than twenty-four hours. They should be gathered, (that is, the Chickasaw and Wild Goose,) when about half colored. This will afford time for re-shipment, or a better market, and will not necessitate an immediate sale on arrival.

BLACK RASPBERRIES.

The demand for this fruit is rather declining than increasing, and the quantity coming to our market now is not equal to that of several years ago. It is being gradually overshadowed and crowded out by the great strawberry crop, for which the demand is steadily becoming more general. It lacks the inviting qualities of the strawberry, and even the first receipts do not command the good prices they formerly did, when it had less to compete with. The strawberry package is adapted to their wants in shipping.

RED RASPBERRIES.

This delicious fruit is deservedly growing in popular favor, and the increased cultivation is hardly keeping pace with the demand for it. The pint box should always be used, and three-gallon crates to suit. Southern Illinois grows most of the red raspberries consumed here — a fact which affords some room for comment.

BLACKBERRIES.

I have not much of an encouraging character to offer under this head. They come in when the market is pretty well crowded with other fruits, and as the fruit does not stand shipping very well, parties at a distance are usually disappointed on examining their returns. Coming in when the weather is usually hottest, they often become sour during a night's ride, and present a sorry picture next morning—the appearance of the cases often suggestive of a collision on the railroad. The home grower has all the advantages in blackberry growing; his fine, large, ripe berries coming in fresh from the bushes, look attractive and toothsome, and he captures all the good prices paid.

GOOSEBERRIES.

The growers having easy access to this market have evidently been forgetting the gooseberry for several years; and this fact has not been overlooked by parties at a distance, principally in Illinois, who are free shippers here, and find the market remunerative. As the gooseberry heats readily, some attention must be given to appropriate packages. A barrel of them will commence heating in about twenty-four hours; therefore, smaller packages should be procured—that of a bushel being most suitable. The strawberry crate and quart boxes are also convenient and safe for parties at a distance.

CURRANTS.

There is a growing scarcity of currants, and why such is the case is rather strange, as the price is usually a paying one, growers in this vicinity receiving from 40 to 50c. per gallon for all they grew the past two seasons. In consequence, northern Illinois is supplying a good portion of our wants, and will continue to do so while inviting prices prevail. Ship in quart boxes and strawberry crates, and do not allow them to get fully ripe before gathering. Fill your boxes well, for they sink down to a wonderful extent after leaving you.

GRAPES.

Here is a subject pretty well understood, and it is difficult to offer anything new or interesting. The most dissatisfied grape growers I have met are those nearest to our market, some of whom plowed up their vineyards to make room for corn and wheat. They find the market almost crowded to death by their neighbors further south, when they bring in their first load. The Hartford appears on the market first. It colors up nicely long before it is ripe, and, dropping off the stems, indicates maturity. The growers take advantage of the situation, and hastily place them on the market. The unsuspecting purchaser invests, and is soon disgusted with the sour, unpalatable fruit that deceived him by its looks. He will not touch another grape for a week. The Hartford should be abolished. It has nothing to recommend it. It works incalculable mischief and loss, which comes home directly to the growers themselves.

A little later the Concord comes in, and deceives nobody. The Concord is the grape for the million. It is purchased and consumed by all classes and for all purposes, and is known to everybody. A number of growers wisely watch the market, and allow their grapes to hang on the vines as long as possible, and thus escape the glut.

The Delaware, as usual, leads all other varieties in price, and the market is never glutted with it. The price usually ranges from 8 to 15c. per pound. Arkansas shipped this variety rather freely the last and preceding season, getting 15c. per pound for most of them. Missouri does not appear to be growing the Delaware to any great extent.

The Martha, Goethe and a few others of the finer sorts appeared regularly for awhile from Missouri growers, but the prices (usually 6 to 8c. per pound) were not regarded satisfactory. The Ives should not be overlooked, and might be considered next in importance to the Concord for general use.

In gathering the fruit, cut out all shriveled, green or partly-decayed berries, and in packing, let the stems always be downward, so the surface of the package will appear entirely free from them. Baskets as grape packages find the greatest favor with buyers, and are decidedly the most appropriate. The baskets used range in size or capacity from five to twenty pounds; the smaller sizes are for the fancy varieties, as such are purchased only in a limited way. There should be a covering of muslin, mosquito netting, or something similar. For long shipments or distant markets, the ten-pound basket, with chip or wooden cover, is decidedly the most appropriate. Such a cover protects the fruit and the basket, and neither will suffer by being piled up in the cars or elsewhere. They are neat packages, admirably adapted to the wants of the retail trade. Baskets of every description are now so cheap that the cost cannot be urged as an objection.

PEACHES.

In the gathering of peaches, very nice judgment should be used as to the proper time to pick to reach a certain market in prime order, getting them neither too green nor too ripe. No matter how alluring the price prevailing when shipping, put in only good, merchantable fruit that you would not be ashamed of if you stood behind the purchaser when he opened and examined it. It is the heavy receipts of poor or indifferent fruit, that break down the market, and you are interested in keeping out and reducing the receipts of such. The poor fruit can be utilized by drying it at home, and thus you can save the fruit and the market at the same time.

In regard to varieties, I may state that the early sorts are not as important to growers in this latitude as they were ten years ago. Arkansas and other States further south fill up the market before your earliest varieties are ripe. These remarks will apply with equal force to all other fruits. You will find it to your advantage now to plant largely of medium to late varieties, beginning with Crawford's Late. A few varieties of the earliest sorts might be profitably grown, such as Alexander and Early Beatrice. But be sure to discard Hale's Early, a variety that has been a steady and positive injury to the market since its first introduction. At one time it possessed the advantage of being early, but that distinction vanished long ago, and now it is before the public without a single redeeming feature. It inflicts the same injury on the peach market that the Hartford does on the grape market. Growers would advance their interests by cutting it out, root and branch. It decays so rapidly, it would be difficult to find a dealer who is not ready to damn it. Nurserymen should not offer it for sale.

The regular peach box (one-third bushel) is used by most shippers. Baskets, any size from six quarts to half a bushel, could be used to advantage by growers convenient to market. The basket is not as safe or desirable for long shipments, unless the cover is such as will admit of piling them up in the cars without injury to the package or fruit.

PEARS.

The amount of pears grown in Missouri appears to be rather small, and in consequence, Illinois, Ohio and New York contribute to the needs of our market, while Arkansas, Kentucky and Tennessee are also represented to some extent every year. The Bartlett is a prime favorite with all buyers, and commands the highest prices paid. The next-best known varieties are the Seckel and Duchesse, though such varieties as the Flemish Beauty, Louise Bonne and Clapp's Favorite would sell as well, though not as widely known. The same packages used for peaches fill the bill here.

In gathering this fruit, as well as the peach, the greatest care should be exercised to avoid bruising. The slightest bruise, scarcely discernible when leaving your hands, presents quite a different picture a day or two later, when it reaches the consumer. The market is never crowded with choice pears.

APPLES.

This fruit figures quite extensively as an article of commerce, and the market for it is no longer confined to the United States. Apples, both dried and green, are now going to European markets quite freely. During the fall season just past, upwards of 100,000 barrels of green apples have been shipped in a single week to Europe from the seaboard cities, principally from New York and Boston, and each succeeding season will doubtless develop more extensive shipments to foreign markets. With these encouraging facts before us, the inducements to grow and cultivate more liberally are stronger than ever.

I have no encouragement to offer the growers of early varieties in this region. The market is glutted every season with Early Harvest and other early kinds, and it will not pay to grow them, except in a very limited way. They are very perishable, and will not bear much shipping; so, very little is consumed in this way. The Bellflower, while it lasts, commands the highest prices paid in this market. The Ben Davis, Rome Beauty and Golden Pippin rank next in importance. Later in the season the demand for the Ben Davis is quite extensive, especially from Texas and other Southern States — our best markets. The Ben Davis is perhaps the only variety which is called for by the car-load by the Texas merchants. The Pennock, Smith's Cider, large Winesap, and similar highly-colored, good-sized fruit, find a good outlet in the same direction. I might mention many others that are, to some extent, worked into this trade; but the varieties specified meet the views of shippers. New York, Ohio and Michigan ship a great deal of fruit to this market every fall, and supply considerable trade that should be filled by home growers; and that there is an opening for such fruit, after paying heavy freight charges, establishes the fact that there is room and encouragement to grow apples here more extensively. A good deal of this fruit comes to our market every season from inexperienced packers, that sells for little more than charges. An apple shipper should provide himself with an apple press, and consider it as important as a barrel in connection with shipping. The packing should be free from deception, using only good, smooth, sound fruit. Always mark the faced end, which becomes the head, with a lead-pencil, if you have no other means of doing so. The name of the apple the barrel contains should be written or printed thereon; also the additional marks or address necessary in consigning or shipping. Never leave your commission merchant in doubt as to which end of the barrel is the faced or pressed end, or what kind of apples you are shipping. Properly packed and marked, he is then enabled to make a sale without opening every barrel—frequently both ends—to find the most presentable one.

I will say, in conclusion, that I have endeavored to point out some of the errors practiced and existing, showing to some extent the wants of the trade where the fruit comes from, and whom you have to compete with as producers, and I trust that a few of the many to whom this paper is submitted will be benefited thereby.

VEGETABLE GARDENING.

BY E. J. HOLMAN, LEAVENWORTH.

One of our best Americans, whose sire and grand-sire were gardeners, and himself a most successful gardener, says: Gardening in its higher sense is both an art and a science It has arrived at this estate by graduations, slow compared with the development of many other pursuits; but that is consequent upon the complex nature of its parts.

Washington, in his agricultural correspondence with Sir John St. Clair, wrote: "It will not be doubted that in reference either to individuals or to national welfare, agriculture is of primary importance." Webster wrote: "Agriculture feeds us, to a great extent clothes us; without it we could not have manufacturers, and we should not have commerce. These all stand in a cluster—the largest in the center, and that largest is agriculture. Agriculture is indeed the most fruitful source of the riches of a country and of the welfare of its inhabitants, and only as the state of agriculture is more or less flourishing, can we judge of the progress of a people."

Gardening, which is agriculture upon circumscribed spaces, has ever shared with the latter the esteem of mankind. Socrates said: "It is the source of health, strength, plenty, riches, and honest pleasure."

Here are the words of the wisest of two worlds, and from ages long past down to the present day. And who of us of Kansas that have given the subject the least devotion, but are ready to echo, 'tis more true to-day than ever before. Gardening is a school in which we may all enter, the first of all schools, and the spot where we best love to spend the last days of a happy life.

In infancy, the scratching and playing in the dirt and the pulling of tiny leaves gives delight and develops the body. Before the lad is ready for his letters, he will be delighted to plant his pop-corn or hill of melons, will learn of its care and culture, with the watching and waiting, and feeling of pride in the proprietorship. A development of mind is inaugurated that makes a foundation for a coming solid man. Vegetable gardening combines pleasure and profit. A good many will refuse to plant a tree or a flower, because they produce nothing to eat or sell. It cannot be so said of vegetable gardening, for it is all to eat or to sell; it should be of both. The same kind of a soul would never have a garden in luxurious variety, for he would be too stingy, too lazy, or too something, ever to carry a fork or barrow-load of manure to enrich the soil that he would have keep him in continual feast. This is the most important and the most neglected part of gardening.

How soon the successful market gardener learns the value of manurial agency, and with what care will he save leaves, weeds, slops, all waste and decaying matter, collecting it in compost form through all the weeks of the year, in order that he may richly feed his soil, and prepare it for greater returns. This is he that gains according to the liberal scattering, or it is he that fails to reap because he has not sown. It is said, gardening was man's first occupation; to day it is the A B C, and the end of time will hardly reveal the Omega of perfection in this art, for it requires study, care, perseverance, and to such is the harvest ample and full. With the last-mentioned traits, any one can succeed in growing vegetables. There are thousands of circulars, registers and books that treat on gardening, from beginning to end; they can be obtained everywhere, and at all times they are requisite, and the careful one will provide himself in time. But while the book preaches, the would-be gardener must industriously apply the knowledge. A great error that prevails in the minds of our people is, that we must have imported seeds for our gardens. This is a good thing for seedsmen; but it is a poor one for us, as experience will fully demonstrate.

The best Flat Dutch cabbage the writer ever grew was from seed saved by himself. The best cabbage grown in this vicinity the past year was of home-saved seed. Sugar corn has continually improved in my hands. The best and most profitable crop of peas ever grown by me were home seed. In the growing of melons, too, many times have disappointment and loss come from trying to get something better. I do not condemn all seeds —far from it; but these instances are given to show the value of saving choice home seeds, and, in the majority of cases, have the greater assurance of realizing one's expectations. Tastes, soil and climate all so differ, that one must plant of numerous varieties, and keep on trying; thus will he be sure to find such as are congenial in every respect, and the most ardent wish will be gratified. Good seed, good soil, good tillage and a good man will bring a good result in every instance.

CULTURE OF ASPARAGUS.

J. W. ROBSON, CHEEVER.

It is surprising that so few of our farmers attempt to cultivate this health-giving and delicious spring vegetable. It vegetates at a season of the year when the appetite has a "hankering" after something green, at that period of the year when the farmers' children are daily sent to hunt up and gather "wild mustard," "sour dock," "dandelion" and "lamb quarter," all of them vastly inferior in taste and juiciness to the succulent asparagus. With very little trouble and expense every farm could have a "bed" attached to it as one of its belongings, which would furnish a dish every day for two months of spring, not only pleasing to the taste, but sweet to the palate.

Ten cents is all the financial investment needed to plant a "bed" one rod wide by twelve rods long. One packet of Conover's Colossal, sown in drills like radish seed, just as thin and covered as deep, will produce a sufficiency of young plants to form the "bed" the succeeding spring.

In the fall, cover the ground for the bed thickly with well-rotted manure; plow the piece of ground very deep, and let it lie thus over winter; a good mulching with stable dung will do it no harm.

Early the next spring open the deep furrows with the plow, three feet apart; dig up the plants out of the nursery row, separate the plants, and plant them one foot apart in the deep furrow, spreading out the roots horizontally, covering the crown with a little soil, and pressing down with the hand. When all the rows are planted, fill in the furrows with the plow, and the job is completed.

The bed must be frequently cultivated during summer, to keep the soil mellow and keep down the weeds. Late in October, cut down the stems with the scythe, and give the "bed" a mulching of three inches. None of the young shoots should be cut the second year. At the end of the second year cut down as before, and mulch. At the beginning of the third year the shoots can be cut daily when about six inches long, till the end of May.

Each succeeding year the process will be the same, cutting in the spring to cook, cutting in October and clearing off the decaying stalks, finishing the culture of the year with a heavy mulching of well-rotted manure. Thus an asparagus bed will be good for a hundred years.

METEOROLOGY.

BY PROF. F. HAWN, LEAVENWORTH.

In submitting this, my annual report, ending with November, I would state in advance that the elements were obtained from the monthly reports of officer A. W. Browne, in charge of the United States observatory at Leavenworth, Kansas; often using his language, as for the want of space I could not introduce his reports entire.

DECEMBER, 1879.

The mean temperature of the month was near 27°, or about 3° below the average; and, as will be seen from the following table, it was over 3° higher than in December, 1878, and 7.5° lower than in 1877. This latter is probably as high an average as occurs here.

COMPARATIVE TEMPERATURES.

1871	24.26°	1874	32.70°	1877	44.20°
1872	21.00	1875	39.90	1878	23.32
1873	31.90	1876	23.30	1879	26.70

The mean humidity of the month was 68.8 per cent., and the rainfall 2.34 inches.

COMPARATIVE PRECIPITATIONS.

1871	0.73 inches.	1874	1.35 inches.	1877	3.18 inches.
1872	1.34 "	1875	2.60 "	1878	2.16 "
1873	5.24 "	1876	0.31 "	1879	2.34 "

The prevailing wind was south, and the total movement 6,611 miles.

The peculiar features of the month were the extremes of temperatures occurring within three days. On the 25th, at sunrise, the thermometer marked 14° below zero; on the 26th it attained 42° above; and at 2 P. M., on the 28th, it marked 68° above zero — a difference of 56° in thirty hours between the 25th and 26th, and 82° between sunrise on the 25th and 2 P. M. on the 28th. During this time, the atmospheric humidity averaged about 55 per cent., or 13 per cent. below the annual average. During the 25th and 26th, the sky was clear, on the 27th cloudy, and on the 28th partially so. Like the preceding month, the temperature and the weather were generally very fluctuating.

JANUARY, 1880.

This month may be marked as one of the warmest Januarys that has occurred here. The highest temperature, 64°, occurred on the 18th and 19th, and the lowest, 20°, on the 31st — a range of only 44°.

The greatest daily range of temperature, 35°, on the 11th; the least, 6°, on the 6th. Mean maximum temperature, 50.90°, and the average minimum, 33.40°. The mean temperature of the month was 41.4°, while the average temperature at Fort Leavenworth, Kansas, for 34 years, previous to 1865, on other records to date, including 48 years, was 28°.

It will be observed that the average temperature reached the extraordinary grade of 13.40° above the mean of near 50 years. This discrepancy will be more particularly comprehended in the statement, that the mean of the month was over one degree above the average for November, and only a fraction below the March averages. It will also be further observed that the lowest temperature during the month was 20°, only 8° lower than the average of the whole month for many years.

To give further expression to those extraordinary results, the foregoing table of mean temperatures is exhibited, including nine years of observations at the United States Signal Station, at Leavenworth, Kansas:

COMPARATIVE TEMPERATURES.

1872	25.00°	1875	16.70°	1878	33.80°
1873	19.00	1876	35.40	1879	23.60
1874	28.40	1877	24.60	1880	41.40

The mean humidity of the month was 69.7 per cent., which is above the mean. Rain fell to the depth of 2.00 inches.

COMPARATIVE PRECIPITATION.

1872	0.13 inches.	1875	0.23 inches.	1878	2.43 inches.
1873	3.02 "	1876	1.42 "	1879	1.16 "
1874	3.14 "	1877	0.73 "	1880	2.00 "

The prevailing direction of the wind was from the south. The total movement from all points, 5,917 miles, of which the highest velocity, 32 miles per hour, was from the northwest. Slight thunder on the 29th.

FEBRUARY.

The highest temperature of this month was 67°, on the 22d, 24th and 27th; lowest temperature, 7°, on the 29th. The mean maximum temperatures, 48.50°; mean minimum temperatures, 28.1°. Daily mean temperature, 37.9°; the daily mean of many years, 31°.

COMPARATIVE TEMPERATURES.

1872	31.0°	1875	22.3°	1878	40.2°
1873	30.0	1876	38.3	1879	32.9
1874	28.8	1877	39.5	1880	37.9

This month, like the preceding (January), was moderate. The lowest temperature fell only to 7° above zero, and the minimum mean to 28°, which is only 3° below the mean of February for many years.

The daily mean humidity was 62 per cent., and rain fell to the depth of 1.40 inches.

COMPARATIVE PRECIPITATION.

1872	0.87 inches.	1875	1.25 inches.	1878	2.94 inches.
1873	1.03 "	1876	0.20 "	1879	0.54 "
1874	1.35 "	1877	0.50 "	1880	1.40 "

The prevailing winds were from the south, and the highest velocity was 32 miles per hour, and from the south.

The most notable feature of the month was the fall of 58° in the temperature on the night of the 27th—from 69° to 11°. This, too, after the Siberian crab trees had burst their fruit buds; the maple trees, (*Acer eriocarpum,*) in full bloom, and the lawns were green; the early apples, peaches, pears and cherries with buds swelled to their utmost size previous to bursting.

That we may understand more fully the influence of this sudden fall and low temperature at this critical development in our prospective fruit crop, the subsequent meteoric changes should be taken into consideration. On the 28th the highest temperature was only 11°, with a mean of the day at 15°, the lowest range in the month; the sky was mostly overcast, and the mean humidity 65 per cent. On the morning of the 29th the thermometer marked 7°, at 2 P. M. 36°; the mean temperature of the day 25°, and the average humidity 68 per cent., with prevailing sunshine. In the next two days the temperature reached the normal by a uniform rise.

[NOTE.—The damage on our grounds consisted in the total destruction of the apricots, and a partial damage to an early variety of peach. It would be superfluous to add, that in common with the whole country, we shared in such a bounteous fruit crop as has rarely been produced in any other country.——In a further digression, would observe, that a gentleman in Leavenworth has an apricot tree on his premises that never produced a crop of fruit until after grading his lot, which lowered the surface several feet, but leaving a pyramid of earth, including the roots of the tree above the new surface. Since then it has never failed to produce a good crop. We see no special reason for this change in the tree, except that its roots are now in close sympathy with the branches above, responding alike to all the atmospheric changes in the day and night, and thus preventing undue development in the fruit buds. The principles involved in the change of the apricot tree were discussed in our report for 1879, p. 30.]

WINTER.

The mean temperature of the winter was 35.3°, or 5.57° above the average of many years. Rain fell to the depth of 5.74 inches, being 2.15 inches above the normal.

MARCH.

The highest temperature, 82°, occurred on the 26th; the lowest, 4.5°, on the 14th; the mean of the month, 42.9°. The highest daily mean temperature, 63.5°, on the 26th; the lowest mean, 18.5°, on the 14th. Mean maximum, 53.5°; mean minimum, 32.3°.

COMPARATIVE TEMPERATURES.

1872	37.10°	1875	37.60°	1878	50.90°
1873	42.10	1876	35.20	1879	46.40
1874	40.00	1877	38.40	1880	42.90

On the 3d and 4th the thermometer ranged up to 73°, and standing at that point at 2 P. M. on the 4th, but by sunrise the temperature had fallen to 29°; from this point the normal temperature was reached, in cloudy weather.

The atmospheric humidity was 61.3 per cent., slightly below the normal.

The rainfall during the month was 2.22 inches, or about .48 inch below the March average; 2.15 inches fell on the 26th and 27th, and for 53 days previous to the 23d, only 1.47 inches fell. Consequently March, to near the close, was dry.

COMPARATIVE PRECIPITATION.

1872	1.90 inches.	1875	2.50 inches.	1878	2.35 inches.
1873	1.75 "	1876	5.78 "	1879	0.32 "
1874	3.05 "	1877	4.39 "	1880	2.22 "

The prevailing wind was north; the highest velocity, 35 miles per hour—from the northwest, at 5 A. M. on the 27th, on the occurrence of the "dust storm." The total movement amounted to 6,899 miles. The direction of the wind was recorded 217 times at the United States observatory in Leavenworth, as follows: From the N. 54 times, N. W. 29 times, W. 5 times, S. W. 16 times, S. 50 times, S. E. 31 times, and from the N. E. 17 times.

Number of clear days, 8; fair days, 16; cloudy days, 7; and on 8 days, snow fell.

The most notable incident of the month was the "dust storm," on the 27th. The dust consisted of brown and black impalpable dust, so dense that the timbered bluffs, half a mile distant, were often invisible. It was so abundant that on the next day, traces of the deposits could be seen on the surface of the ground, and on the floor of a north porch, sufficient to receive the imprint of a cat's feet. The phenomenon was preceded on the day previous by a sultry atmosphere; sky heavily overcast; temperature at sunrise, 69°; 2 P. M., 82°, and at sunset, 74°, with a daily mean barometer at the lowest point in the monthly range—a strong southwest wind prevailing, and at night thunder and lightning, with rain and hail. A similar phenomenon is reported from the Catania observatory, in Sicily, that occurred about 36 hours subsequent to its termination here, to wit: "On the night of the 29th of March, a shower of meteoric dust fell at that place, and a considerable quantity was collected at the observatory. It consisted largely of iron, either in a purely metallic state, or in oxydized particles." The near coincidence in time between the phenomenon here and in Sicily, with an apparent similarity in the properties of the dust, might suggest a common origin. The probabilities are increased when we learn that the dust moved from west to east, or in the direction of the revolution of the earth, regardless of the surface currents of wind, as appears from the United States Signal Service Review for March, No. XV: "This area appeared in British Columbia the afternoon of the 24th, [March]; Portland, barometer .48, and Fort Benton, barometer .45 below the normal. Moving southwestward, it was in Idaho the morning of the 25th, and by an easterly path, was in central Nebraska the afternoon of the 26th. Omaha, barometer .75 below the normal. At that time the pressure in the entire Missouri and upper Mississippi valleys, was .66 below the normal. At that time, brisk easterly winds prevailed in the entire lake region and Mississippi valley, generally accompanied by rain and brisk northerly winds from the Missouri valley westward. On the morning of the 27th, the area was central in eastern Iowa—Davenport, barometer 1.04 below the normal—in the afternoon in northern Illinois, and at midnight in northwestern Ohio. During the day, violent wind storms occurred in the upper Mississippi and lower Missouri valleys, and in the upper lake region, westward from the Missouri valley to the Rocky Mountain slope, but little or no rain falling, remarkable *dust storm* prevailing."

APRIL.

The highest barometer was 30.492, on the 7th; the lowest, 29.040, on the 18th — the lowest on record at the United States observatory, extending back for eight years.

The highest temperature was 89°, on the 23d, which is the highest temperature during any April in the past eight years, at the observatory; the lowest temperature, 31°, on the 7th. The mean temperature was 56.4°, about 3° above the normal.

COMPARATIVE TEMPERATURES.

1872	56.2°	1875	49.8°	1878	58.8°
1873	48.6	1876	55.2	1879	55.4
1874	49.0	1877	53.3	1880	51.6

The mean per cent. of atmospheric humidity was 51.6; the April average is 59 per cent.

The rainfall was 1.38 inches, or 2.59 inches below the April average, and the lowest rainfall on record at the observatory.

COMPARATIVE PRECIPITATION.

1872	3.63 inches.	1875	1.67 inches.	1878	2.86 inches.
1873	5.07 "	1876	7.65 "	1879	3.57 "
1874	2.80 "	1877	7.14 "	1880	1.38 "

The effects of the lack of rain in this month were augmented by the drouth that prevailed during February and March.

The prevailing wind was from the south; total movement, 793 miles; highest velocity, 60 miles per hour, on the 18th. This was a gloomy day for the Northwest. A widespread hurricane and storms prevailed over large areas, involving the destruction of hundreds of lives and millions in property. Of the wind's direction, 210 observations were recorded, as follows: N. 52 times, N.W. 34 times, W. 10 times, S.W. 9 times, S. 57 times, S. E. 24 times, and E. 6 times.

April, on the whole, was an abnormal month.

MAY.

The highest temperature 90°, on the 6th; the lowest 47°, on the 1st. The highest daily mean was 82°, on the 13th; the lowest 59.7°, on the 27th. The mean temperature was 71° — the highest May mean on record of the United States observatory, dating back to 1872, and 6° above the May average.

COMPARATIVE TEMPERATURES.

1872	65.7°	1875	65.8°	1878	62.8°
1873	63.0	1876	65.5	1879	69.0
1874	67.3	1877	68.8	1880	71.0

The monthly mean percentage of atmospheric humidity was 56.4 per cent., or 7 per cent. below the May mean.

The rainfall amounted to 5.01 inches, which is .26 inch below the May average; of this, 2.08 inches fell on the 25th, and 1.21 inches on the 26th.

COMPARATIVE PRECIPITATION.

1872	7.91 inches.	1875	3.53 inches.	1878	5.28 inches.
1873	5.38 "	1876	6.78 "	1879	8.04 "
1874	1.60 "	1877	8.67 "	1880	5.01 "

Thunder storms on the 8th, 9th, 25th, 26th, and 30th.

The prevailing wind was from the south; highest velocity, 32 miles per hour; total displacement, 6,640 miles. The direction of the wind was recorded 217 times, to wit: N. 45 times, N. W. 7 times, W. 5 times, S. W. 4 times, S. 89 times, S. E. 38 times, E. 16 times, N. E. 2 times, and calm 11 times.

Number of clear days, 9; fair, 17; cloudy, 5; and days on which rain fell, 9.

May also, as well as April, was an extremely dry month; with the lack of rain, we had an unusually dry atmosphere, scarcely any dews, and a prevalence of high, hot winds.

SPRING.

Mean temperature of the spring months was 55.1°; mean for nine years at the United States observatory, 49°; mean for thirty-four years previous to 1865, 53.8°.

The rainfall amounted to 8.61 inches; average fall for 9 years at the United States observatory at Leavenworth, was 11.89 inches. The mean rainfall for 34 years previous to 1865, at Fort Leavenworth, Kansas, was 7.32 inches.

JUNE.

The mean temperature of the month, 74.7°, which is a fraction above the normal. The highest temperature, 90°, occurred on the 23d; the lowest, 52°, on the 1st. The mean maximum was 82°; mean minimum, 65.4°.

COMPARATIVE TEMPERATURES.

1872	77.2°	1875	76.7°	1878	70.5°
1873	75.5	1876	71.2	1879	78.8
1874	77.4	1877	71.9	1880	74.7

Although the thermal range did not reach a very high point, yet the daily mean was above the normal.

The mean atmospheric humidity was 61.6 per cent., or 6 per cent. less than the normal.

Rain fell to the amount of 1.69 inches, or 4.26 inches below the average, and was the smallest rainfall in June on the records of the United States observatory at Leavenworth.

COMPARATIVE PRECIPITATION.

1872	4.75 inches.	1875	3.85 inches.	1878	5.27 inches.
1873	8.15 "	1876	5.71 "	1879	9.90 "
1874	4.96 "	1877	10.00 "	1880	1.69 "

Although rain fell on ten days, yet it was not sufficient at one time to do much good.

On the 10th of June the Concord and Clinton grapes commenced rotting in some unfavorable localities, but not generally. The rot was confined mainly to six succeeding days, or up to the 15th, involving a loss of about 10 per cent., while most other vineyards were comparatively exempt. During this period of six days, the daily mean temperature range in their respective days, 81.5°, 80.2°, 80°, 80.5°, 76.5°, and on the 16th, 68.5°; the daily mean humidity, 66, 68.3, 69, 69.3, 66.7, and 59 per cent.; and on the 4th, .13 inch of rain fall, on the 5th, .16 inch, on the 7th, .22 inch, and on the 10th, .22 inch.

These results were preceded by the following atmospheric conditions: May had been an unusually dry month, up to the 25th; only .63 inch of rain had fallen; but in the remainder of the month there was a fall of 4.38 inches. Of this amount, 3.29 inches fell on the 25th and 26th. From this latter rainfall to the 10th, when the grapes commenced rotting, including nineteen days, the fall was only 1.82 inches, and the mean atmospheric humidity most of the time below the normal. With such results before us, it will be seen that most of the supposed normal conditions in the promotion of grape rot are wanting, especially a redundancy of moisture in the soil.

The prevailing wind of the month was from the south; the total movement was 6,100 miles; highest velocity, 32 miles per hour, and from the south, on the 5th. The direction of the wind was recorded at the observatory 210 times, as follows: N. 13 times, N.W. 17 times, W. 6 times, S.W. 6 times, S. 106 times, S.E. 32 times, E. — times, N. E. 6 times, and calm 13 times.

The month was notable for the absence of storms. Two only occurred — on the 4th and 5th, which were not violent, though the barometer on the 5th ranged lower than at any time since the establishment of the United States observatory at Leavenworth.

JULY.

The highest temperature of the month was 95°, on the 13th; the lowest, 56°, on the 20th. The mercury reached or exceeded 90° on six days only. The highest mean temperature, 84.2°, on the 9th; the lowest, 68.5°; and the daily mean of the month was 78.2°.

COMPARATIVE TEMPERATURE.

1872	78.4°	1875	77.6°	1878	80.3°
1873	77.2	1876	78.9	1879	79.8
1874	82.8	1877	76.3	1880	78.2

The mean maximum temperature was 85.7°; the mean minimum, 67.6°.

The daily mean humidity was 61.6 per cent., or 6 per cent. below the average.

The total rainfall was 6.86 inches, which is 1.50 inches above the July average; of the total amount, 5.11 inches fell on the 2d and 3d.

COMPARATIVE PRECIPITATION.

1872	6.66 inches.	1875	8.82 inches.	1878	3.08 inches.
1873	2.04 "	1876	4.00 "	1879	4.99 "
1874	3.23 "	1877	5.34 "	1880	6.86 "

After the copious rainfall on the 2d and 3d, only a few nominal showers occurred up to the 30th. This lack of rain, with the previous drouth in June, renewed the drouth in the latter part of this month, to the serious damage of garden vegetables. Up to the 15th, when the grape rot commenced, the mean daily temperature had ranged considerably above the normal, with little or no rain. The grass on the Leavenworth common had become crisp and comparatively dry, and we were in the midst of a drouth that materially affected the late crops. Between the 15th and the 20th the temperature was somewhat lower, with very cool nights, and on the night of the 20th, when the rot had assumed a definite form, the temperature fell to 56°, the lowest range in July on record here, extending back to 1865, and a daily mean of 68.5°—a range that rarely occurs in July. In this period of five days, the atmospheric humidity ranged considerably below the mean.

The following from the United States observatory exhibits the atmospheric conditions, including the most active period of the grape rot, on their respective days, from the 15th to the 20th: 78.7°, 75°, 76.5°, 79.2°, 70.7°, and on 20th, 68.5°; and the daily mean humidity, 64, 56.3, 59, 60.7, 58.7, and on the 20th, 54.7 per cent. These latter means were all below the normal. In a vineyard on low ground, not favorably situated for ventilation, where the range of temperatures between the day and the night must necessarily be much greater than on more favorable exposures. Moreover, this vineyard is thirteen years old, the soil exhausted, and has received no tillage for several years; has been close pruned in the spring, and cut back in the summer. The crops have rarely been free from rot, and always more damaged than other vines in the vicinity. The loss this year from the June rot was about ten per cent., and from the July rot, thirty per cent. while two vineyards in close proximity, on higher locations and on strong soils, were comparatively free from rot; yet a vineyard on the slope of the bluffs, ninety feet above, and on a soil more exhausted than the other three referred to, was the least affected by the rot. In July all the supposed normal conditions of the grape rot were wanting.

The primary cause of this rot is not very apparent, but its nascent character was seen in a small disk, of very regular form, gradually enlarging, until the whole berry is involved. It may be readily distinguished by its lighter color, which finally assumes a russet brown. When examined in its early stages, a very small speck of sap is found exuding from the center of the disk, very much as if punctured by some insect; this soon becomes a crust of russet-brown color. In the June rot, however, I found an additional puncture outside the center of the disk. These punctures could hardly have been the result of plethora in the fruit, for in the July rot most of the vines had ceased growing, and the grapes maturing had been stunted by the drouth, and, furthermore, the most vigorous vines and largest fruit were injured least.

I would further remark, that this rot passed through all the phases it usually assumes in this vicinity. It is evident that moisture in the soil had nothing to do with it, at least in July, for a serious drouth then prevailed; nor from excessive humidity in the atmosphere, for the moisture was much below the normal. So, too, the temperature that then prevailed reached the lowest range on record in Leavenworth, extending back to 1865. Unless the rot was connected with the extreme and sudden changes in the meteoric conditions, principally in temperatures incident to July, I am at a loss even to conjecture the influences on the grape rot of that month. The problem seems to resolve itself into this: that it either influences the fruit directly through abnormal functional activities of the vine caused by the great ranges in the temperature between the day and the night, or indirectly in developing sporadic parasites that attack the berry. I rather incline to the latter, for those varieties of grapes having thick skins and probably less vulnerable to such attacks, notably, the Ives Seedling and Dracut Amber, side by side with the Concord, were wholly exempt from rot.

In examining authorities on the subject of grape rot, I find two phases of this disease. Mildew, which first attacks the vine, generally after rainy and damp weather. This is a parasitic fungus, for which sulphur, applied by means of a bellows, thus dusted over the vines and fruit, has been found to be a partial remedy. Prof. Husman recommends close and early summer pruning as a preventive, as it throws all the strength of the vine into the young fruit, giving free access of air, and causing early development. What is known as gray "rot," or "grape cholera," generally follows mildew. This is probably the disease that affects the Catawba vines.

What is called the spotted or brown rot, is undoubtedly the disease that prevails in Leavenworth county, and which is the subject-matter of the foregoing discussion. It has been very destructive of late years in some localities, and for which no specific has yet been discovered. Longer fall pruning and heavier bearing of the vines is recommended. This accords with my observation.

Leaving the digression, I will proceed with the main subject of the report.

The prevailing wind of the month was south; total number of miles moved 4,466; highest velocity, 38 miles per hour. The 210 observations made were: N. 46 times, N. W. 15 times, W. 15 times, S. W. 15 times, S. 85 times, S. E. 25 times, E. 3 times, N. E. 5 times, and calm 8 times.

The number of clear days during the month, 12; fair days, 17; cloudy days, 2; and 10 days on which rain fell.

AUGUST.

The highest temperature in the month, 98°, on the 18th; lowest, 52°, on the 3d and 4th.

The mean temperature was 77.6°, which was about normal. From the 12th to the 19th inclusive, the heat was intense, the temperature ranged above 92° on each, and on the 17th, 18th and 19th, the markings were 97° or above.

The total rainfall during the month was 7.06 inches, or 4.00 above the mean, and the greatest August rainfall on record, extending back nine years, 6.33 inches, fell after the 23d.

The mean atmospheric humidity was 62.27 per cent., or about 1 per cent. below the normal.

SUMMER.

The mean temperature of the summer months was within a fraction the same as that of 1879, which was the warmest summer since 1874. The monthly ranges have a like correspondence. The mean of the summer months for thirty-four years ending in 1866, as observed at Fort Leavenworth, was 74°. The observations at the United States observatory at Leavenworth, since 1871, show a gradual increase over this mean — the mean of the last nine years being 76.6°.

The total rainfall during the summer was 15.61 inches — about 1.50 inches over the summer mean.

The following table shows the mean temperature and total rainfall of the summer months of the past nine years:

Year.	*Mean Temperature.*	*Total Rainfall.*
1872	78.0°	21.23 inches.
1873	77.4	7.59 "
1874	80.5	9.93 "
1875	75.8	16.40 "
1876	76.1	18.12 "
1877	74.4	18.19 "
1878	73.2	11.66 "
1879	76.9	15.07 "
1880	76.8	15.61 "

SEPTEMBER.

The highest temperature during the month was 85°, on the 5th; the lowest, 43° — the lowest on record at the observatory. The mean temperature was 65.6° — 1° below the September average.

COMPARATIVE TEMPERATURES.

1872	67.7°	1875	66.6°	1878	67.8°
1873	65.4	1876	66.0	1879	65.9
1874	66.8	1877	67.9	1880	65.6

The daily mean atmospheric humidity was 67 per cent. — 2.50 per cent. above the mean.

The rainfall of the month was 2.78 inches —.50 inch less than the September average.

COMPARATIVE PRECIPITATION.

1872	4.42 inches.	1875	1.97 inches.	1878	2.64 inches.
1873	3.64 "	1876	3.56 "	1879	3.41 "
1874	5.50 "	1877	1.95 "	1880	2.78 "

The prevailing wind was south; the highest velocity 24 miles per hour, from the northwest. Of 210 observations, the wind's direction was N. 34 times, N.W. 24 times, W. 2 times, S.W. 1 time, S. 83 times, S. E. 29 times, E. 7 times, N.E. 9 times, and calm 13 times.

Number of clear days, 12; fair days, 12; cloudy days, 6; and days on which rain fell, 9.

The weather during the month was generally clear and pleasant; the average cloud-space was only 37.5 per cent.

OCTOBER.

The highest temperature, 79°, occurred on the 9th and 10th; the lowest, 30°, on the 18th.

The mean temperature of the month was 52.7°, which, with the exception of 1873, is the lowest October mean on record at the United States observatory, in Leavenworth. The October average for 34 years, as observed at Fort Leavenworth, is given as 54.7°.

COMPARATIVE TEMPERATURES.

1872	56.0°	1875	53.4°	1878	55.2°
1873	50.7	1876	53.7	1879	62.1
1874	57.0	1877	54.5	1880	52.7

The mean of the atmospheric humidity amounted to 62.2 per cent., which is about the normal.

The total amount of rain was 3.69 inches, or 1.25 in excess of the October average; 2.56 inches fell in one storm of twelve hours, on the 2d and 3d.

COMPARATIVE PRECIPITATION.

1872	2.06 inches.	1875	0.72 inches.	1878	1.16 inches.
1873	1.56 "	1876	2.79 "	1879	4.25 "
1874	1.49 "	1877	4.87 "	1880	3.69 "

The prevailing wind of the month was south; the total movement was 4,842 miles; the highest velocity was 24 miles per hour, on the 9th, 15th and 25th. Of 217 observations of the wind, it was from the N. 47 times, N. W. 21 times, W. 7 times, S. W. 9 times, S. 61 times, S. E. 17 times, E. 3 times, N. E. 9 times, and calm 43 times.

Number of clear days, 12; fair days, 14; cloudy days, 5; and days on which rain fell, 7.

The meteoric conditions during the month were remarkably uniform; generally fair weather, with no violent storms.

NOVEMBER.

The highest temperature of the month was 60°, on the 2d and 3d; the lowest 8°, on the 21st. The mean temperature of the month was 31.9°, being 3° lower than that of any November since the establishment of the United States observatory, in 1872, although the minimum temperature was lower in November of 1872 and 1875.

COMPARATIVE TEMPERATURES.

1871	38.1°	1875	37.0°	1879	44.6°
1872	35.0	1876	37.6	1880	31.9
1873	41.8	1877	39.5		
1874	40.0	1878	45.7		

The mean atmospheric humidity was 67.8 per cent., about 2 per cent. above the average.

The total rainfall, including melted snow, was 2.40 inches; of this, 1.92 inches fell on the 10th.

COMPARATIVE PRECIPITATION.

1871	3.94 inches.	1875	0.89 inches.	1879	7.87 inches.
1872	0.06 "	1876	2.78 "	1880	2.40 "
1873	0.89 "	1877	2.44 "		
1874	3.46 "	1878	1.76 "		

The first snow of the season fell on the 17th.

The prevailing wind of the month was north; the highest velocity, 24 miles per hour, from the north, on the 16th; total movement, 3,031 miles. The direction was observed 210 times: from the N. 36 times, N. W. 34 times, W. 5 times, S. W. 9 times, S. 34 times, S. E. 4 times, E. 1 time, N. E. 2 times, and calm 85 times.

The number of clear days during the month was 12; fair, 8; cloudy, 10; and days on which rain and snow fell, 10.

AUTUMN.

The mean temperature of the autumn just closed was 50.1°, or 4° below the normal, which was the lowest autumn mean on record at the United States observatory in Leavenworth. The autumn mean temperature at Fort Leavenworth for 34 years previous to 1866 was 53.7°.

COMPARATIVE TEMPERATURE.

1872	53.0°	1875	52.4°	1878	56.0°
1873	52.6	1876	52.4	1879	57.5
1874	54.6	1877	54.4	1880	50.1

Rain fell to the amount of 8.87 inches, 1.50 inches in excess of the average.

COMPARATIVE PRECIPITATION.

1872	6.84 inches.	1875	3.08 inches.	1878	5.56 inches.
1873	6.09 "	1876	9.22 "	1879	15.81 "
1874	10.45 "	1877	9.26 "	1880	8.87 "

This has been a phenomenal year. We have had a meteoric dust storm that traversed the continent, and, seemingly, half the circumference of the globe. Local abnormal conditions, such as summer temperatures in the winter; then, again, the lowest thermal range in the summer on record here; in several of the months the least rainfall on our records, and another the greatest; redundant rain storms, followed by protracted drouths. The Northwest suffered grievously from cyclones, hurricanes and storms, with death and destruction in their path. Nature's forces were, semingly, directed in spasmodic efforts. Such have been the tendencies for the last few years, with a gradual increase in the summer temperature, and an increase in the annual amount of rain. Are there any known causes why these changes should become permanent?

CUMULATIVE.

In answer to a letter from your President, Prof. E. Gale, under date of July 26th, I referred to some of the influences that may develop such results. Like causes, referred to in those letters, have preceded great changes on the western slope of the mountains, as appears from recent examinations made by Prof. Legate. An extract of the published results is quoted as follows:

> "It was for the purpose of ascertaining the cause of this remarkable change of climate that Prof. Legate went on his expedition into the mountains. Through the results obtained by observations made at many points, with various delicate instruments, but principally by means of careful thermometrical tests, the Professor has established the fact that there has occurred in the range of the Sierra Nevada mountains this season, a grand isothermal change. He finds that the warm current of air which ever since the

settlement of California by the Americans—and probably ages before—has moved upward from the Pacific seaboard to the Sierra Nevada mountains, and thence turned and flowed to the northward along the west side of the main ridge of the range, thus giving to all regions in that direction a warm climate, no longer moves in that direction. It now comes up from this side of the ocean and pours eastward, directly across the crest of the Sierras, near Lake Tahoe. Prof. Legate has satisfied himself that this wonderful change which is leaving all the northern parts of the Sierras buried in snow, summer and winter, is caused by the denudation of timber which the mountains have suffered through a belt beginning at Lake Tahoe, and extending some twenty miles southward, through the great gap thus left by the sweeping away of the forests. The denudation of the ground is the principal cause. The heat of the sun pouring down upon the broad belt of the bare ground now reaching across the mountains, causes at that point an immense ascending column of heated air, which draws in from the west the current which formerly moved to the northward, and now all crosses the Sierras, passing in an upward and eastward direction."

METEOROLOGICAL YEAR.

The highest temperature of the year at the United States observatory at Leavenworth was 98°, on August 18th; the lowest, 14° below zero, on December 29th. Mean temperature of the year, 54.7°; the annual average temperature since 1872, 53.7°. The annual mean temperature of the year at Fort Leavenworth for 34 years previous to 1865 was 52.8°, or an increase of 1° up to the close of 1880.

COMPARATIVE TEMPERATURES.

1873	52.6°	1876	53.2°	1879	54.8
1874	54.8	1877	54.1	1880	54.7
1875	51.4	1878	55.6		

The total rainfall in the year was 36.48 inches; the annual average precipitation at the United States observatory at Leavenworth is 39.04 inches; the annual average rainfall at Fort Leavenworth for 34 years previous to 1865 was 31.34 inches, an increase of 7.70 inches up to the close of 1880.

COMPARATIVE PRECIPITATION.

1873	35.17 inches.	1876	44.46 inches.	1879	41.55 inches.
1874	33.65 "	1877	52.06 "	1880	36.84 "
1875	31.26 "	1878	35.13 "		

REPORT OF COMMITTEE ON GRAPES.

BY DR. J. STAYMAN, LEAVENWORTH.

Mr. President, and Fellow-Members of the Kansas State Horticultural Society: In presenting this report on grapes, we beg leave to state, that owing to the condition of the grape crop for several years past, we find it necessary to go over more ground than usual in making a report of value and practical utility.

That there has been very great loss by *rot*, I need scarcely state, as many of you have seen more or less of it. But so alarming has it lately become, that the Commissioner of Agriculture, at Washington, has seen fit to send out circulars over the country to the most experienced and practical grape growers, for statistics and information upon the subject. It has put such a blight upon grape culture, that many have discontinued it, and have gone to other more profitable pursuits. Others have dug up their vines, and commenced anew with other varieties, or a different system of cultivation, hoping thereby to reap a better reward for their labor. We find ourselves among this class of experimenters. This grape malady appears to be confined to no particular locality, although we often find a difference in the same vineyard.

So many theories respecting the cause and cure of this disease have been presented, without any relief, that it appears like presumption to offer any; and before we do so, will call attention to some important facts connected with this subject.

In our observations among the best European grapes grown in this country, we find less grape rot than among the American varieties, and where we do find it to any extent, it is in proportion as they have become Americanized. The question naturally arises, Why should this difference exist between nationalities? There can be only one answer to this question, and we think the solution not very difficult, when we take into consideration both systems of culture. We were brought up in the school of European culture, but were Americanized at too early a period to reap the benefits of it, until sad experience and blighted hopes called it back to our memory, and forced us to adopt it. The American method of culture is a "slip-shod" system; it has neither a commencement nor ending, except in failure, unless by accident, Nature should make it a partial success, as she sometimes does.

If we examine the various American authors upon the subject, we find but little agreement, if any, in location, preparation of the soil, depth of planting, distance they should be apart, pruning or training. Some say plant the vines four or six inches deep, while other say about a foot. Set the vines six feet by six apart, while others contend that from fifteen to twenty feet is not too far distant. Plow deep and give good culture, while others plow say shallow or not at all, for fear you may cut or tear the surface roots, as they are the main feeders to the vine. Some say prune short, while others say prune little if any. We ask, where is the consistency in this system of culture?

If we now compare this with the European system, we will see a vast difference. To condense the matter and make it concise, we shall embody it into a few general principles.

First, they recommend a warm, dry situation; second, very deep and thorough preparation of the soil; third, very deep planting; fourth, the surface roots all cut off and kept off; fifth, very deep and thorough tillage; sixth, rather close planting, not even six feet by six; seventh, prune in proportion to the vigor of your vines, so you do not overload them; eighth, plant those varieties that make the best wine. These few simple rules, all experienced grape growers believe and adopt, as long custom has established them and general success has proven them correct.

The most successful vineyards ever established in the United States were upon this system, at Cincinnati, by the late Nicholas Longworth, and the best work ever written upon the subject was by his vineyardist, Charles Reemelin, a German, in 1856. This system died there with the death of its founder, and so did his vineyards, and no one has been able to resuscitate them. Our vineyards here are fast hastening towards the same desolation, and we fear no hand can stay them. The only hope left is to learn from the past and commence anew; adopt the long-tried and successful European system. Although it may appear tedious and unnecessary, in the long run it will prove the cheapest, best, and most profitable.

To more fully illustrate and demonstrate some of these principles, we will give a few examples. In regard to the first principle, location, there is but very little said about the absolute difference and practical value of different situations for grapes. We harp much more about the varieties adapted to a location than we do about the best situation adapted to them. There are many instances of as much difference in locations not over a mile apart as there is in several hundred miles distant; so this difference is not always bounded by geographical lines. We have vineyards not over two miles apart, and have repeatedly demonstrated by actual *test* that there is a difference in the saccharine matter of six pounds of Concord grapes of from four to five ounces. Six pounds of grapes in the one contained seventeen ounces of sugar, while the other only thirteen ounces. This may appear to be a small matter and to be of little value, yet when we consider that the richness, quality and value of the fruit depend almost exclusively upon the amount of sugar it contains, it will throw a different light upon the subject. Although this difference in a pound of grapes may not amount to more than two-thirds of an ounce, and appear small, yet when we estimate it by the acre, it will show in a very different light. An acre of grapes planted as they should be, six feet by six apart, will contain over twelve hundred vines, and when in full bearing, twelve pounds of grapes to a vine would be a very low average estimate. According to this estimate, we have over six hundred pounds of sugar to the acre in one location more than in the other. This sugar, at the low price of five cents per pound, would amount to thirty dollars per acre—a difference in permanent value of three hundred dollars an acre at ten per cent. interest. In other words, it would be as cheap to pay three hundred dollars per acre for the best location, when money is worth ten per cent., as to take the other as a gift. It may be supposed by some that this difference is confined to some isolated situation, but this is not the case, for it extends over a very large section of country, as various tests have shown.

Now if we take into consideration the eighth European rule that we have given, namely, plant those varieties that make the best wine, we will find results still more remarkable. Mr. Longworth was so fully convinced of this fact that he made a standing offer of one hundred dollars to any person who would produce a better grape for wine than the Catawba Although some may not believe in making wine, it nevertheless does not invalidate the rule, for the body and quality of the wine depend upon the amount of sugar the grape contains. In other words, the rule amounts to simply this: Plant those varieties that contain the greatest amount of sugar, as they will prove the best. This rule is as true and important now as it was then, although we may have different objects in view.

As we have shown the difference and value of different locations with the Concord grape, we shall now state that we cannot reach the maximum amount of sugar with that variety. The Concord, under the most favorable conditions herein stated, contains, in six pounds of grapes, seventeen ounces of sugar. We have other varieties under the same conditions, equally as hardy, and not subject to rot or any other disease, that contain, in six pounds of grapes, twenty-four ounces of sugar. Here we have a difference in varieties alone over others, amounting to over one thousand pounds of sugar per acre. Now if we take our former estimate, resulting from location, being six hundred pounds, and this latter from choice of varieties, we have one thousand six hundred pounds per acre—a difference in location and varieties of eighty dollars per acre. This amount has been a total loss in at least a thousand cases to one, from lack of a proper knowledge upon the subject.

Then we ask, why does not grape culture pay better? If we should sustain this much loss in any other pursuit, it would prove a total failure with all who engaged in it. Then in whatever light we take grape culture, in the proper selection of locations and varieties, with reasonable attention it will be found as remunerative, if not more so, than any other fruit crop.

If we estimate the products of an acre according to their commercial value, we will find the following results: Twelve hundred Concord vines per acre, at twelve pounds of grapes per vine, at two cents per pound, amount to two hundred and eighty-eight dollars. If we estimate this in sugar at five cents per pound, it amounts to one hundred and twenty-seven dollars per acre, and the same in syrup, at fifty cents per gallon. This amount of saccharine matter will produce twelve hundred gallons of wine, by natural fermentation, and this at forty cents per gallon will amount to four hundred and eighty dollars. This product will produce by the acetous fermentation, two thousand gallons of the very best and finest vinegar—better than the highest standard cider vinegar; this at twenty cents per gallon will amount to four hundred dollars per acre.

Now if we base our calculations upon our best grapes, which never rot, that contain one pound and a half of sugar to every six pounds of fruit, we increase the above values about one-third; so we will have in that case one hundred and sixty dollars for the lowest estimate, and six hundred and twenty dollars for the highest, per acre. These estimates may appear too high to some, but every experienced grape grower knows that twelve pounds of grapes to a vine is a very low estimate. But to make it fully sure, let us throw off one-half, for good measure, or bad luck if you prefer it, and we still have left one hundred and forty dollars for the Concord, and for our best varieties, one hundred and eighty dollars per acre. This is better than strawberries, blackberries or raspberries at two hundred dollars per acre, or to wait twenty years for apples, and sell them at twenty cents per bushel, as many of us have done.

But as we stated, the grape rot has so demoralized the grape growers, that unless we can give a remedy, they will have to abandon grape culture. This remedy we have already outlined to some extent, but it may not be fully understood. It will be found embodied in those few simple rules given in the European system of culture. If they are thoroughly followed, as they were at Cincinnati, the Concord grape will be as free from disease here as the Catawba was there. Further, let those who wish to be convinced of this fact, heavily mulch their vines, and keep them in that condition, and observe the results, and they will soon be satisfied that the surface roots must be either heavily mulched, or cut off, and kept in that condition, and the ground deeply and thoroughly cultivated.

Lastly, plant only those varieties that are free from rot and disease, as they are the best. As this report was more particularly intended to give the present condition of grape culture, our remarks have been principally confined to the Concord grape, as that is the one mostly cultivated. We would, however, here remark that the Early Victor grape, which originated here with Mr. John Burr, Esq., from what we have seen and know of it is the most valuable of the Labrusca species that we have seen, either for market or wine, and so far entirely free from disease. This grape we first described in our report on new and valuable fruits to the American Pomological Society in 1877, and will be found published in their proceedings.

If in the future we shall have an opportunity, we will discuss and show the value of different species and varieties.

LANDSCAPE GARDENING.

BY PROF. E. GALE, MANHATTAN.

Landscape gardening is defined "the art of laying out grounds and arranging trees, shrubbery, etc., in such a manner as to produce the most pleasing effect." Agriculture may justly be regarded as rising to the dignity of a science, but perhaps we must accept the definition as above given, and count that department of earth culture which we are now to consider, notwithstanding the high place which it has so long held in the estimation of intelligent men as simply an art. Being the most advanced outgrowth of cultured rural life, we would naturally expect more of system and more exactness of definition than in any other department of agriculture, and yet in this we shall be most lamentably disappointed. We find everywhere the evidence of the most crude and chaotic ideas, bespeaking only of "the anarchy of thought and chaos of the mind."

The reason for this, in part, may be found in the fact that landscape gardening has, in its range and application, been narrowed to a field and class of work altogether beyond the reach of the great mass of our rural population. The practice of the principles of landscape gardening, in improving and beautifying country homes, has been regarded usually as a costly luxury that should in nowise enter into the calculations of the man of moderate wealth. Much as it is to be regretted, the leaders of thought on this subject have far too often, both in their writings and practice, justified this conclusion. For in their teachings we find very little that is applicable to conditions that do not command great wealth. This view of the art we regard as an almost fatal mistake.

When properly understood, there is no department of earth's work of more universal application, and in which all classes should be more interested, than in what is termed landscape gardening. Under this name we embrace the highest class of work, with respect to the earth's surface, in which man can engage. We recognize the fact, that for immediate effect, wealth is needed; but we should remember that the first requisite is brains. Here the call for a cultivated mind is as imperative as for cultivated fields. Landscape gardening, while it is the outgrowth of both agriculture and horticulture, has in some respects a wider range than either. We see it as the art of moulding the earth's surface until it shall be transformed into exquisite patterns, and until all homes may have a framing of beauty that shall make them like "apples of gold in pictures of silver." It is the taking of the wild and rude in nature, and transforming all into beautiful homes. While, then, with respect to the kind of labor required, we might call it "*earth culture,*" but with respect to the ultimate object of all, we would call it "*home making.*" In this we seek to fix in the surrounding landscape those elements of form and color that are calculated to charm and satisfy the peculiar wants of a cultivated mind, and to throw around a home those subtle and nameless ties that somehow spring from the wise blending of the beautiful, picturesque and sublime.

Grounds of limited extent afford no scope for landscape effect, and in such grounds the skill of the artist will be seen in the harmonious blending of the small plat with the more extensive surroundings. This thought is not only applicable to small plats of land, but also largely to all farm work.

There are three lines that may be held as elementary in all landscape gardening: first, vertical, or lines of elevation, which will embrace a careful study of the real and apparent difference of altitude; second, the geographical, or ground line, embracing the study of the relative position of different objects —determining the outline of all grounds, as parks, clumps of trees, shrubs, forests, lakes, and the relation of any natural features in the landscape to artificial structures, as well as the study of the direction of all drives and walks; and third, we have the line of the horizon, or sky line, to be studied and modified as surroundings may demand. These are the elements of our study —the alphabet of the art. All our work is based on the relation of these lines; for example, we seek to determine the course of a drive or walk—clumps of trees, masses of rocks, or other immovable objects may turn it to the right or left, or the angle of ascent or descent may determine its direction. We find ourselves, then, brought down simply to the study of lines; and in the power to blend these lines harmoniously will be seen the artist's skill. All the essential rules of landscape gardening resolve themselves into a determination of the merits of different series of lines. For example, we find a landscape marked by gently-undulating lines. We have a sameness of outline, and we call the prevailing features tame. We soon weary of the uniformity. Let clumps of trees or shrubs be characterized by the same features, and for the same reason they become objectionable. We have a marked example of these gently-undulating lines in the natural growth of our river timber. This almost unbroken uniformity soon becomes tiresome, and we almost instinctively wish to see it broken up, either by partial removal, or by higher plantations; and thus the sky line may be sensibly modified. Thus, by careful plantations, the apparent depth of the valleys may be increased, and the rounded form of the hills essentially changed, and a vivacity secured, which in the original is often wanting. This is all accomplished by changing elementary lines, and this, not by the removal of a yard of earth, but by the most inexpensive plantations. The same principle applies to single clumps of trees. All here depends upon judicious selection of varieties, having diverse habits of growth. Thus we may obtain, instead of the tame mass, a sprightly group. The same law applies to the ground line, or boundaries of groups and larger plantations. We shall need to be constantly on our guard, lest we allow a uniformity of outline to creep into our plantations. Here we have simply to study the relation of a series of lines. Again, we may go on to the study of curves suited to walks or drives in the park or garden. These curves have a relation to each other and to surrounding objects; immovable natural or artificial objects may control them. These illustrations, perhaps, will be sufficient to show that the work of landscape gardening consists essentially of the *analysis of forms*, or, more exactly, of the *line* as the element of all form.

Lines and forms may be symmetrical with respect to each other, or they may be unsymmetrical. If we examine a picture or a natural object, we shall find that its beauty consists in the harmonious arrangement of its lines. If we consider carefully these lines, we shall find that the entire object is measured by them. So, the measure of everything in landscape gardening is the line, and the harmony of lines is our chief study. We find one line balancing another everywhere in nature, and yet in all there is infinite variety;—

every curve and combination of curve having somewhere its counterpart, and expressing in some way the purpose of the Infinite mind.

[Note.—The above is only a synopsis of the discussion presented by the committee, as the whole text could not be intelligently presented without a series of engravings.]

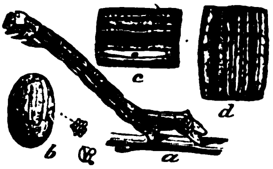
ENTOMOLOGY.

COMPILED BY THE SECRETARY, G. C. BRACKETT, LAWRENCE.

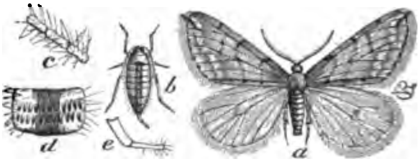
CANKER WORM.

(*Anisopteryx vernata.*)

"This species, which, from the fact that the bulk of the moths issue from the ground in early spring, has been termed the Spring Canker Worm, is distinguished by the following characteristics, viz.: By each of the first seven joints of the abdomen, in both sexes, bearing transverse rows of stiff, red, or reddish-brown posteriorly directed spines; by the front wings of the male having three transverse, dusky lines, and a somewhat broader, jagged, pale submarginal line; and by the whole body in the female, as also the legs and antennæ, being pubescent with pale and dusky hairs, the color being rabbit-gray, or speckled black and white, the abdomen having a medio-dorsal black stripe. The dusky stripes on the front wings of the male, except at sides, and the black stripe on the abdomen, except at each end, are usually more or less obsolete; and indeed the ornamentation of the wings is extremely variable. In many specimens the middle portion of the front wings, within the three dusky lines, is quite pale, and mottled with grayish-green, while the basal and terminal portions are marked with brown, thus making the contrast greater. Others again are absolutely without any marks whatever, even when fresh from the chrysalis, while captured specimens always have the marks more or less effaced on account of the looseness of the scales. The moths rise from the ground for the most part early in spring, and only rarely the previous fall. They are crepuscular in habit—that is, not entirely nocturnal, but are most active soon after dark in the evening. The female, by means of a horny and extensile ovipositor, thrusts her eggs, to the number of from fifty to one hundred and fifty, under the loose scales of bark, or in any crevice or sheltered place, and is very fond of availing herself for this purpose, of the empty cases of the 'Rascal Leaf Crumpler.' The eggs are but



[Figure 1.]



[Figure 2.]

slightly glued together, and have the form of a rather elongate hen's-egg, the shell being very delicate and smooth, though often appearing roughened by transverse and longitudinal irregular depressions. The larva (worm) has but four prolegs, is variable in color, and one of its distinguishing characters is the mottled head and two pale, narrow lines along the middle of the back, the space between them usually dark, and occupied on the anterior edge and middle of joints by black marks, somewhat in form of X—these marks being represented by dots on the other joints."—*Riley.*

"The females are wingless, and therefore are not able to wander far from the trees upon which they have lived in the caterpillar state. In the early part of the season these caterpillars do not attract much attention, but it is in June, when they become extremely voracious, that the mischief they have done is rendered apparent, when we have before us the melancholy sight of the foliage of our fruit trees and our noble elms reduced to withered and lifeless shreds, and whole orchards looking as if they had been suddenly scorched with fire."—*Harris.*

"The moth emerges from the ground with the first mild weather in the latter part of winter and early spring, and immediately makes its way to the nearest tree, and crawls up its trunk. The winged males are now seen fluttering about the wingless females, and after pairing, the females deposit their eggs and perish. The eggs hatch out about the season of the flowering of the common red currant, which varies from one to two weeks, according to latitude and character of season. The worm attains to its full growth in about one month, when it lets itself down by a fine thread, and burrows from two to six inches into the ground, and assumes the chrysalis state, in which it remains, with a few exceptions, through the winter."

In order to protect our trees from the ravages of Canker Worms, it should be our aim, if possible, to prevent the wingless females from ascending the trees to deposit their eggs; and as an effectual means to accomplish that end, Prof. Cyrus Thomas, State Entomologist for Illinois, offers the following, viz.: Make a slight mound around the tree, smooth it at the top, then tie common wrapping-paper around the base of the body, turn it down on to the mound of earth and coat it with thinned tar. The ground will prevent measurably the too rapid drying of the tar. Common sorghum syrup, thickened with flour, and applied as recommended for tar, has been used successfully. Other persons have found a band of cloth or paper from four to six inches wide, placed around the body of trees near the base, and besmeared as above stated, proves a barrier to the female moth ascending the body of the tree.

Another, and Mr. Thomas feels confident the most effectual method, is, to encircle the body of the tree near its base with a hay or any common hemp rope, fastening the ends by nailing them to the tree; then over this band fasten a tin band from four to five inches wide, so that there will be a margin of the tin above and below the rope. It has been found that the female moth will be almost wholly defeated in her efforts to pass such an obstruction, and will deposit her eggs on the body of the tree below the band.

A wash of kerosene will destroy all eggs with which it comes in contact. Tests have proven that such a wash is harmless to the tree, and can be safely applied in the spring. The point to be reached in using the tarred bands is to secure a sticky surface, over which the moth cannot pass. That will require a fresh coating of the material used each day, to be effectual. The statement is reliably made, that two men can re-coat the bands on two thousand trees with an average diameter of six inches in a day, that the first coating will require about ten gallons and each subsequent coating eight gallons of the material used. The work of coating the bands must continue for one month from the first appearance of the moth.—*Le Baron.*

Prof. Riley indorses the rope and tin band as the most successful method, and further says: "If the female moth succeeds in depositing her eggs, and the worms hatched gain possession of the tree, then spread a coating of hay, straw or litter that will burn under the tree; jar it, and as the worms will drop down on their web, with a pole sweep them on to the hay, and set fire to it. This will aid materially in destroying the worms, and should be followed up until none appear from the jarring."

NATURAL REMEDIES.

Prof. J. W. Robson, of Cheever, says: "The bluebird destroys large numbers, not of the larvæ alone, but of the fully-developed moths, just as they emerge from the ground. The cedar-bird is a gross feeder, and when this insect appears in great numbers, it will also be present in large flocks, and feed upon them daily, until the pest is subdued. The butcher-bird also feeds its young upon the larvæ, and well do I remember how effectually a pair of these birds cleaned two trees which were literally covered with the Canker Worm."

"Mr. C. J. Maynard, of Ipswich, Mass., furnishes the following list of species of birds which devour the Canker Worm: The Red-eyed Vireo, Song Sparrow, Chickadee, Scarlet Tanager, Robin, Black-billed Cuckoo, Wood Pewee, Least Pewee, Wilson's Thrush, Black and White Creepers, Blue Yellow-back Warbler, Prairie Warbler, Black-polled Warbler, Red Start, Cedar-bird, Cat-bird, Purple Finch, White-winged Cross-bill, Chipping Sparrow, Indigo-bird, Red-winged Blackbird, Crow Blackbird, Baltimore Oriole, King-bird, House Pigeon, all the Vireo family, Downy Woodpecker, Summer Yellow-bird, Purple Grakle, Bluebird, Golden-winged Woodpecker, Golden Robin, Yellow-billed Cuckoo."—*Riley.*

REMARKS ON THE CANKER WORM, BY D. W. HOUSTON, GARNETT, KAS.

The first I noticed of the Canker Worm in my orchard, was about the 20th of April, 1879. I had not been among the trees for several days, and was surprised one morning to see the leaves turning brown. This orchard consists of 4,000 trees, on upland prairie—part of it is level and part sloping to the east. It looked at this time like an Ohio beech "deadening." On examination, I found the trees were covered with a smooth worm, from one-half to one inch long, and the younger ones were very dark green, turning to a dirty black, as they grew to their full size. They do not gather in nests or bunches,

Google

but are distributed singly over the trees, from one to a dozen on every leaf, On jarring the trees they let go and swing down by a web, and in such numbers that they cast a shadow on the ground. If left undisturbed, they wind themselves up again. If their web is broken, they fall to the ground, and at once crawl to the body of the tree and ascend it. They move like a measuring worm. I inclosed specimens of these worms to the Secretary of the State Horticultural Society, and received the answer that "the specimens sent are the much-dreaded New England Canker Worm."

In ten days from the time I first saw them, there was not one to be seen. They all had dropped down and gone into the ground. They had defoliated about 300 trees.

The first weeks of January, 1880, were quite mild. I find the following entries in my diary:

"JANUARY 21.—I find many little moths, some with wings, but mostly wingless, at the roots of my apple trees and under the rough bark on the bodies of the trees, I suppose they are the Canker Worm moth. They are about three-eighths of an inch long, of a dirty-gray color.

"JANUARY 26.—Weather calm and warm. The air is full of flying moths coming from the orchard.

"JANUARY 27.—Sent samples of both winged and wingless moths to Mr. Brackett.

"JANUARY 29.—Rainy, accompanied with thunder and lightning. In the evening it froze hard. I hunted for the moths, and found a very few.

"JANUARY 30.—The moths have all disappeared. Received word from Mr. Brackett that the specimens received were the Canker Worm moth, and that they had laid eggs on the cork, inside of the bottle, before they reached him.

"FEBRUARY 2.—The ground frozen hard. I can find no moths.

"FEBRUARY 6.—Thermometer 22° above zero at sunrise. Sunshine and pleasant at noon. Thermometer 48° in the shade. I find moths all through the orchard, hid at the roots of the trees and under the rough bark on the bodies. I found many eggs on the trees."

In the latter part of February we had the coldest weather of the season—thermometer down to zero. On March 2d I examined the orchard; found plenty of moths and eggs; trees were covered with them up to the second and third forks; neither eggs nor moths seem to have been affected by the cold; the eggs are laid in clusters, and are of a bright golden color, very small—about the size of the eggs of a fly.

On the 29th and 30th of March, I thought they were all spoiled or spoiling, so they would not hatch; but this was an error. If I had had a good glass, I would have seen them hatching by millions, for in a few days they appeared in the bloom and on the fruit buds. At first they were so small that they could scarcely be seen with the naked eye, but soon grew to their full size. They dropped off about the first of May, leaving about 3,000 of my trees as bare of foliage as they were in January.

This is the history of this most terribly-destructive enemy of the apple tree, so far as my experience has gone. Now for some conclusions: I am satisfied that the most intense cold we have in this climate will not affect them. The only variety of apples that escapes their attacks is the Rawles Genet. This variety leafed out and bloomed so late that they were injured but little. I tried paper bandages, tied tight round the bodies of the trees, and smeared with coal tar. This prevents the females (which are all wingless) from crawling up, so long as the tar is soft; but it hardens in two days' time, so the worm crawls over it. I tried washing the bodies of the trees with lye. This seemed to destroy the eggs where it touched them; but they were hidden so closely under the bark, and in every crack and crevice, that it was impossible to destroy them in this way. I tried scraping the outer bark off, not leaving a spot from the roots to as high as we could see an egg; and yet the trees we scraped and washed seemed to be infested with as many worms as those we did not touch.

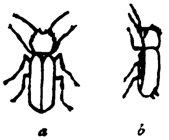
A letter from a friend in New England says they have been troubled with this insect for twenty years, and they have entirely destroyed some orchards. After defoliation for several years, the trees become exhausted and die. There they smear the bandaged trees with printer's ink, and consider this a sure remedy, if done in time and with care. The bandages must be tight, or the moths will crawl under them, and the ink kept soft by frequent application, or they crawl over. I think the newly-discovered poison, called "London purple," will kill the worm. The best way to apply this is to put one pound of the poison into forty-eight gallons of water, in an open barrel; set the barrel in a wagon; drive along each side of the tree, and thoroughly shower it with a force pump. This, if the water is not spared, will, I think, kill the worms, but would not save the present crop, as the worm attacks that in the blossom, before it commences on the leaves.

The pest is spreading. Last year it was in three other orchards that I know of, and I very much fear will overrun the country if not checked.

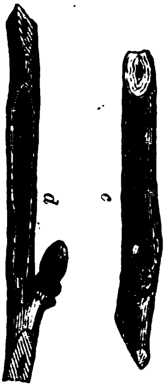
THE APPLE-TWIG BORER.

(*Bostrichus bicaudatus.*)

"This little beetle is a dark-brown insect, varying from one-fifth to two-fifths of an inch in length, the thorax rounded and rough-punctured, especially in front, where it is produced into two little horns and covered with small, rasp-like prominences. The wing-covers are also rough-punctured, and while in the female, they have but a slight keel-like elevation at the hind end, they are furnished in the male with two little horns, from which characteristic the specific name (two-tailed) is derived. The species does not occur on the Atlantic sea-board, but is found in the whole country between the Alleghany and Rocky Mountains, becoming more and more common as we progress westward, and being most common in the States immediately west of the Mississippi. Its range southward is at least as far as Texas. The holes made in the twigs generally have their entrance just above a bud or fork, [as at Fig. 4, *d.*] I have never known this insect to bore more than one and one-half inches into the twig, [Fig. 4, *d*,] and the



[FIGURE 3.]



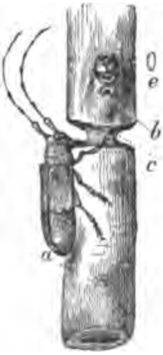
[FIGURE 4.]

holes are generally made downward and in wood of the previous year's growth, though I have seen them exceptionally bored upward and in three-year-old wood. The beetles seem to prefer varieties, such as the Benoni and Carolina Red June, to other varieties of apples, and though they likewise occur in grape, pear, and peach stems, I have never found them in those of the crab-apple. Both the male and female beetles bore these holes, and may always be found in them, head downward, during the winter and spring months. The holes are made for food and protection, and not for breeding purposes. Indeed, common as this insect is, its preparatory stages are entirely unknown, and that person who will ascertain its larval history will confer a favor on the community. The probabilities are that it breeds under the bark of oak trees, and that it is in such situations that we must search for its larva. We may furthermore infer that it comes to maturity late in the summer, and flying into our orchards and vineyards, the beetles bore into the twigs during the fall. Here winter overtakes them, and they hibernate in the holes, some dying, but most of them surviving till spring, when they continue feeding for awhile, and afterwards repair to the forest again to propagate their kind. I have caught both sexes flying as early as the middle of March, during genial, sunny weather.

"The bored twigs generally break off by the wind, or else the hole catches the water in spring, and causes an unsound place in the tree The only way to counteract the injuries committed by this beetle, is to prune the infested twigs wherever found, and take great care to burn them with their contents. It is in the nursery that most injury is done, as the insect is seldom so numerous in an orchard of large trees as to more than cause what the philosophic orchardist has been wont to term 'a good summer pruning.'"—*Riley.*

THE TWIG GIRDLER.

(*Oncideres cingulatus.*)



[FIGURE 5.]

"The Twig Girdler, according to Prof. Haldeman, may be seen in Pennsylvania during the last two weeks in August and the first week in September, feeding upon the bark of the tender branches of young hickories. Both sexes are rare, particularly the male, which is rather smaller than the female, but with longer antennæ. The female makes perforations [Fig. 5, *b*] in the branches of the tree upon which she lives, which are from one-fourth to one-half an inch thick, in which she deposits her eggs [one of which is represented, of the natural size, at Fig. 5, e]. She then proceeds to gnaw a groove, of about a tenth of an inch wide and deep, around the branch and below the place where the eggs are deposited, so that the exterior portion dies, and the larva feeds upon the dead wood. In all cases noticed by Prof. Haldeman, the tree attacked was the shag-bark hickory, and the twig was girdled so shallowly as not to fall off until the larva had matured within it, or nearly a year after the girdling. In most of the cases which we have ourselves noticed upon pear and persimmon trees,* the twig was girdled so deeply that it broke off and fell to the ground with the first wind, and while the eggs that had been laid in it by the mother beetle were still unhatched. Nothing surprises us more in the history of the American Twig Girdler, than the great number of eggs that may sometimes be found in one amputated branch. In a persimmon branch not more than two feet long, we have counted as many as eight eggs, placed one under each successive side shoot; and we have found seven eggs all crowded together in a small hickory branch only three inches long. Now, judging from the amount of timber consumed by the larvæ of other boring beetles before they arrive at maturity, such a branch could scarcely nourish seven larvæ. How can we account for such a phenomenon? Is it an exceptional case of mistaken instinct? Or does the mother beetle, in order to guarantee the success of her handiwork, habitually lay a superabundance of eggs just as the Tachina Fly, that is parasitic upon our northern Army Worm, lays upon an average three eggs upon each worm, although each worm is only large enough to feed a single Tachina Fly? Upon either hypothesis, some of the young larvæ that hatch out must either occasionally or normally be starved out or destroyed by their more robust or fortunate brethren, just as many kinds of spiders, when they first hatch out from the egg, prey mercilessly upon one another until only a few overgrown individuals are left from the original brood."—*Riley, p. 76, vol. 1, American Entomologist.*

WHITE PINE LEAF LOUSE.

(*Mytilaspis pinifoliæ.*)

During February last, specimens of the whorls of white pine growth, covered with a minute scale-covered insect, were sent to this office by J. W. Latimer, Esq., of Linn county, Kas., who asked a determination of the substance affecting the growth of the trees to a damaging extent. The specimens were sent to Prof. F. H. Snow, of the Kansas State University, for identification, who pronounced them to be the insect above named in the caption of this article.

Dr. Wm. Le Baron, (formerly State Entomologist of Illinois,) in his first official report, says: "This species appears in the form of a little oblong, white, muscle-shaped scale, one-tenth of an inch in length, attached to the leaves, and differing but little, except in color, from the well-known scales of the Oyster-shell Bark Louse of the apple tree. The insect, indeed, though it lives upon the leaves instead of the bark, belongs to the same family and the same genus as this last-mentioned notorious species. I do not know that they infest the tree in its native forest, but they are very injurious to ornamental trees—not only to the white pine proper, but also it would seem to a still greater extent to the variety known as the Gray or Scotch pine. They sometimes multiply so as to almost completely whiten the foliage, like a fine snow storm. They belong to the sucking, as distinguished from the gnawing division of insects, and impoverish the leaves to a greater or less extent by imbibing their sap. The leaves turn brown and unsightly, and in some cases the whole tree presents a sickly and decaying appearance. The scale with which the insect covers itself assumes a different form upon the two varieties of pine above mentioned. On the narrow leaflet of the white pine the female scale has a slender and linear form, exactly corresponding to the width of the leaf on which it is moulded; but on the broader leaf of the Scotch pine, where it has space to expand, it may be supposed to assume its normal shape. It here often appears almost in the form of an elongated triangle, with its terminal or shorter side rounded. This species produces two broods in a year; one of which, like the single brood of the apple species, passes the winter in the egg state, safely protected under the maternal scale. The eggs are of a blood-red color. Their number averages about twenty-five to each female. This brood hatches quite early in the spring, and the young mature and begin to lay the second brood by the 1st of July, and by the middle of that month the work of deposition is completed. In about one month's time these eggs hatch, and the young fix themselves on the nearest leaflets, many of them settling upon the same leaflet on which they were hatched.

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* Also, the apple and white elm.—Sec'y.

REMEDIES.

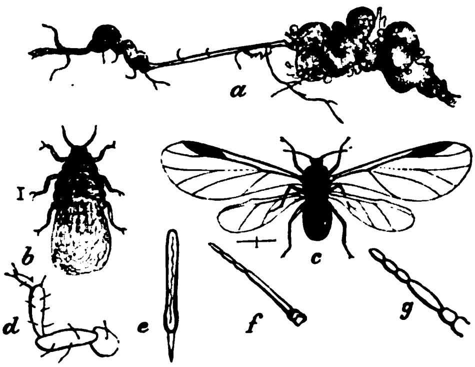
"The practical conclusion is, that owing to the double-brooded character of this species, and the protracted manner in which the eggs are hatched, no *single* application of any remedial substance will suffice, as it does in the case of the common Bark Louse of the apple tree. These applications will have to be made at two different seasons of the year, in order to reach both broods. The application, to reach the first or spring brood, should be made once a week during the month of May. The second brood will require attention, to simplify the matter as much as possible, once a week through the month of August.

"A wash composed of common fish-brine, diluted at the rate of one pint to two gallons of water, also soapsuds of the strength of one gill of soft soap to a gallon of water, or when the plants are wet with rains or dews dust the branches affected thoroughly with unleached ashes, will destroy them. Such applications, by way of tests, did not injure the foliage of the trees. If soapsuds are to be used, the coarse whale-oil soap is preferable. Apply all washes by means of a garden syringe, which throws the liquid in the form of a fine shower."

THE APPLE-ROOT PLANT LOUSE.

(*Eriosoma pyri.*)

Fig. 6, in the body of this article, fully illustrates the Apple-root Plant Louse, highly magnified; *a* is a portion of a root as it appears after being attacked by this louse—the knotty or warty excrescences being caused by the punctures of the insect in search of the plant juices for food; *b* illustrates the larva, and *c* the winged state; while *d* represents the leg, *e* the beak or proboscis, *f* an antenna of the winged individual, and *g* that of the larva — all highly magnified. The hair-lines just below the left wing of the perfect insect (*c*), indicate the natural size of the perfect insect, with expanded wings. The young louse is of a deep flesh or pink color, and the proboscis extends the whole length of the body, while the older specimens have a deeper purplish hue. Many confound this insect with the Woolly Aphis, or louse found upon the under side of limbs on the tree. This one confines itself to the roots, with rarely an exceptional case, while the woolly louse equally adheres to the portions of the tree above ground. A few of the root species may occasionally be found on the suckers that spring up around the butt of the trunk, and even on the trunk and limbs, especially in places where a branch has been formerly amputated, and nature is closing up the old wound by a circle of new bark; but such cases are rare. Wherever this insect works, small as it is, it may be easily recognized by the peculiar bluish-white cottony matter which it secretes from its body.



[FIGURE 6.]

NATURAL REMEDIES.

From the enormous rate at which all plant lice multiply, it is plain that, if there were no checks upon the increase of the Apple-root Plant Louse, it would, in a few years, sweep away whole orchards, especially in southern latitudes. Luckily for the fruit growers and the fruit lovers, there exist two, at all events, and probably three such checks. The first is a very minute parasite fly, which infests the larva state of the insect. The second, the Root-Louse Syrphus Fly (fully illustrated on following page, at Fig. 7), is one of our most valuable aids in the reduction of this troublesome enemy. Like the larvæ of many other parasites, it is voracious in appetite, and makes rapid work in devouring the minute root lice. The appearance of this, as well as of all other parasites, should be thoroughly studied, that a ready discrimination can be made between friend and foe. The third insect which preys upon these root-plant lice, at least in Missouri [and Kansas — SEC'Y] is a small species of Ladybird.

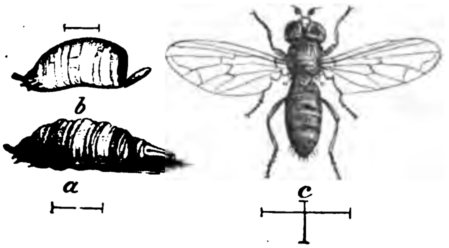
ARTIFICIAL REMEDIES.

Mulching placed around trees infested with this root louse is found to have the effect of bringing the lice to the surface of the ground, where they can be easily reached and destroyed by abundantly drenching the ground with hot water. (Another means used, is dressing the ground around such infested trees with wood ashes, which leach with the rains, saturate to quite a depth, and prove fatal to all the lice they reach. Young trees obtained from nurseries sometimes contain these lice upon their roots (resembling white mould), and can be cleaned of them by dipping the roots in a weak lye; they will then be safe for planting, and will generally produce as vigorous, healthy trees as others.——To nurserymen let the injunction be given, and doubly emphasized, that, for their own reputations' sake as honorable, intelligent and "square" men, having the highest regard for the horticultural interest of our State and an honest desire for the success of those engaged in rearing orchards, they should never allow trees infested with this louse to go from their grounds—not even for thrice the price of clean trees—thereby scattering the seed that shall cause an incalculable injury and losses of the most serious character; and the nurseryman who is not well informed with reference to the insects and their habits, which infest the trees and plants which he propagates and offers for sale in the market, is disqualified for the pursuit, has mistaken his calling, and there exists no apology for him.—SEC'Y.)

ROOT-LOUSE SYRPHUS FLY.

(*Pipiza radicum.*)

This friendly insect, which preys upon the Apple-root Plant Louse, represented at Fig. 6 of this report, is seen in the larva or worm form at *a*, Fig. 7—a footless maggot about half an inch long, and of a dirty-yellow color. It is generally found more or less covered with mud, and with the woolly matter secreted by the lice, and is not by any means easily discerned. It changes in the fall to the pupa state (*b*, Fig. 7), from which, in the following spring, there emerges the perfect fly, as shown at *c*, Fig. 7, in enlarged form, the lines underneath indicating the natural size.



[FIGURE 7.]

In this cut, *a* represents the larva; *b*, the pupa; *c*, the perfect fly.

To the foregoing is added the experience of Mr. A. Willis, of Ottawa, Kansas, who has been most seriously injured by this aphis during several years past, and having resorted to the use of all methods known in the shape of washes and applications to the tree and upon the ground around the trees, with no satisfactory relief, falls back upon his own inventive ingenuity, stimulated by dire necessity, saves himself, and establishes another practical demonstration of the unreliability of alkaline or other washes, as a successful preventive against the attack of sap and wood-devouring insects which assail the apple tree. To Mr. Willis's persistent and untiring energies are due the commendations of Kansas horticulturists at least, for his determination of a reliable method of successful warfare on one of the most destructive insect agencies known to young apple trees, both in the nursery and orchard:

Ottawa, Kas., December 28, 1880.

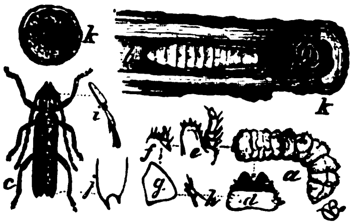
G. C. Brackett, *Secretary:* In compliance with your request, I herewith furnish you with a statement of my observations and conclusions with reference to the Woolly or Apple-Tree Root Louse, which I conclude are identical, and which has been so disastrous to my young apple trees. I say identical, for the louse that was found on the roots was the same as formed colonies on the bodies of the trees. It is very frail and tender, and possesses but little power to move from place to place; hence it would be impossible for it to move from tree to tree under ground, but must pass through the air by the aid of winds to a great extent. So we find it scattered promiscuously in the tops of trees, in the axils of leaves, in crevices and wounds of the bark on the trunks, and sometimes at the junction of limbs, wherever it can effect a lodgment. Immediately thereafter the female commences laying eggs, from which hatches the young colony of aphidæ. This occurs during the fore part of summer. The young mature and migrate, some to other trees, if circumstances are favorable, and many go down to the roots of the trees, and there thrive and increase until winter. Late in summer and autumn a few can be found in the tops of the trees. During the past season I first found colonies on the trees from June 2d to the 4th. I then ran over the trees and destroyed with my hand all I could find, and repeated the work through each succeeding five weeks, when but very few could be seen. In the fall, at digging-time, my nursery trees were almost entirely free from them in the tops or on the roots, nor were there any puffs or excrescences in the bark at the base of the buds, while last year there were very many of them on the trees where no effort had been put forth for their destruction — though late in the summer and fall of last season very seldom was the aphis found on the tops, but on the roots it was very numerous, literally covering the surface.

I feel satisfied that the means I adopted are the surest method of eradicating this pest from our nurseries and young orchards.

THE TWIG PRUNER.

(*Elaphidion parallelum.*)

"The beetle is long and slender, and of a dull bay-brown color. The female beetle lays her eggs in June. Each egg is placed close to the axil or joint of a leaf stalk, or of a small twig near the extremity of a branch. The grub hatched from it penetrates at that spot to the pith, and then continues its course toward the body of the tree, devouring the pith, thereby forming a cylindrical burrow, several inches in length, in the center of the branch. Having reached its full size, which it does towards the end of summer, it divides the branch at the lower end of its burrow by gnawing away the wood transversely from within, leaving only the ring of bark untouched. It then retires backward, stops up the end of its burrow near the transverse section with fibers of the wood, and awaits the fall of the branch, which is usually broken off and precipitated to the ground by the autumn winds. Branches five or six feet in length and one inch in diameter are thus severed by these insects. By collecting the fallen branches in the autumn and burning them before spring, we prevent the development of the beetles. This insect attacks the apple and pear tree."—*Thomas.* [Also, the box-elder.— Sec'y.]



[Figure 8.]

FORESTRY DEPARTMENT.

KANSAS FORESTS AND FORESTRY.

BY E. N. PLANK, INDEPENDENCE, KAS.

As one approaches from the East the great prairie regions of the United States, the absence of evergreen trees from the forests attracts his attention. He finds that he has left behind, not only the pine forests, but even the isolated trees of that species which in seeming pride lift their heads high above their less pretentious, deciduous neighbors; and the Hemlocks, the most beautiful and graceful of all our native evergreens, no longer appear, covering the cold, moist hillsides; and he sees no swamps filled with Cedars, or Arbor Vitæs, or the Tamarack. He notices also, that while the number of species, perhaps, does not diminish, yet a less number of genera is represented. The Beech, and the Tulip tree with its cousins the Magnolias, gradually disappear as we approach the Mississippi; the Sugar Maple barely obtains a foothold in Kansas; the Basswood is not at home with us, and the Chestnut and Chinquapin are not found here at all; yet with her large number of species of Hickory, and especially of Oak, Kansas is not far behind any of the States in the number of species of forest trees found growing within her borders.

The limits prescribed for this essay, and the object proposed to be attained by it, alike forbid an extended description of the trees and shrubs which compose the forests of Kansas; yet a brief account of the more important and valuable species of our native flora may not be out of place in this connection.

There are growing in this State probably one hundred and seventy-five species of plants with a woody stem, of which number sixty or more, attaining a height of more than thirty feet, may properly be called trees. Of those, the Black Walnut is perhaps the most important, and individually is the most high-toned, aristocratic and valuable of American forest trees. Though widely disseminated—growing in every State from the Atlantic ocean to the Rocky Mountains, and from Canada to the Gulf of Mexico—it is nowhere abundant. It seems to cost Nature such a supreme effort to raise so grand a tree, that she is unwilling or unable to make them common. Possessing great intrinsic value for finishing and decorating purposes, the fashion and wealth of the world now claim it for their own. It is largely sought after in this country and in Europe, and already rivals mahogany in value. Men are now traveling over this State, and the States east of us, for the purpose of buying up every Black Walnut tree that is for sale; and faster than most of us are aware, these grand old trees are being cut down, and shipped from this State, at a price but little above that paid for common lumber. Within the next fifteen years, Kansas will need for the decoration of her own homes and public buildings all the Black Walnut trees that ever stood at any one time within her borders; and at the end of that period, unless measures are taken to prevent its destruction, there will hardly be a tree of this species in the State large enough for lumber.

The wholesale destruction of the Black Walnut that has taken place upon the settlement of every State where it grows, is a National calamity. In many localities where it was once found native, it is now only seen upon the lawn, or in cultivation for its fruit, and where the trees once stood, their stumps are being dug out, to be sawed into veneering. Magnificent trees of this species have been cut into firewood, split into fence-posts and rails, and used for building barns and common buildings, that if they were now standing would add millions of dollars to the wealth of the country. It is well known that the Black Walnut is easily raised, and that it grows rapidly, but it must be remembered that the solid, beautifully-grained and dark and richly-colored heartwood, that is so much admired and highly valued, cannot be produced in a few years nor in a lifetime: it is the work of centuries of growth. The Black Walnut has been known to reach a height of more than one hundred feet, with a diameter of six feet; and trees eighty feet high, and three or four feet in diameter, are frequently seen. The person upon whose land a few large, old walnut trees are growing, is rich. Two or three of them may be worth more than all his land; for within a few years individual Black Walnut trees have sold in Michigan for twelve hundred dollars, and for a single "Blister Walnut," two thousand dollars have been been refused.

Kansas has at least six species of Hickory. Of these, the Pecan forms the most symmetrical and beautiful, as well as most valuable tree, especially for its fruit—the well-known pecan nut of commerce. This tree, like the Green Ash and the White Ash, is very much disposed to come up and occupy the ground where the original forest has been cut off, to the exclusion of other species of timber. I have seen a second growth of hundreds of individuals of this species growing along little creeks and occupying almost the entire ground. The growing demand for the fruit of this tree, which is likely to greatly increase in the near future, and the high price that it commands in the Eastern markets, will render its cultivation a profitable pursuit. Few better investments of capital could be made, even in Kansas, than to plant out an orchard of a few thousand trees of this species upon the rich bottom lands. The tree grows rapidly, bears young, and is healthy, long lived, and generally free from the attacks of insects. An orchard of Pecans will cost no more than an orchard of apple trees, and will prove far more profitable. Next to the Pecan, the common "Shellbark" is the most valuable of the Hickories, but it is not so much disposed to come up everywhere and to take care of itself as the Pecan, in favorable localities. The "Shellbark" grows over a much wider extent of country than the Pecan, and yields a less valuable fruit. Its cultivation cannot be made as profitable, except for fuel and timber. But any species of Hickory will not be out of place in a timber plantation in localities where the seeds of one species can be more easily procured than that of another.

The family of Oaks are numerously and well represented in Kansas, and, with the Hickories, form the bulk of her forests. Those species that are valuable for timber are worthy of general cultivation.

The Sycamore of the West, more generally known in the East as the Buttonwood, or Buttonball, is a grand and beautiful tree; and until the discovery of the "Big Trees" of California, it enjoyed the distinguished honor of being the largest known North-American tree—and it is still as large and magnificent as ever, with no rival east of the Rocky Mountains. I have measured trees of this species thirty-three feet in circumference, and others larger have been found. It appears to be more healthy and to thrive better here than in the East. The wood of the Sycamore is not very valuable except for fuel, though it is sometimes used by cabinet-makers. This species possesses two or three characteristics which render it valuable in localities not well furnished with timber. In the struggle for existence, it is one of the last trees to give up, and a few individuals of the species are not unfrequently found standing alone around some damp place or along some little stream. Its seeds are light and easily scattered by the winds, and, with its humble namesake, the Buttonbush, and with the Cottonwood, it is one of the first trees to leave the vicinity of the larger streams, and, like a true and brave pioneer, to strike out for itself and find a new home along the smaller creeks and "draws." When old trees are cut down, sprouts readily grow from the stumps, and a coppice is soon formed.

The Box Elder is one of the most valuable of our native forest trees. I fully agree with all that Prof. Robson and others have said in its favor; but just here I wish to enter protest against the name by which it seems to be most commonly known—a name which is entirely inappropriate, and without significance, as this beautiful tree is in no way related to the "Elders;" it is simply and only a Maple, and as such the name of Ash-leafed Maple, sometimes given it, is at once significant and proper, conveys no false impression, and alone should be used when speaking of the tree. The system of nomenclature of trees and plants needs a thorough revision, or perhaps it would be more proper to say that a system of nomenclature needs to be created that shall give to every well-known species of the vegetable kingdom *one* common name, which shall be as far as practicable a name already in use, and one that will describe some characteristic form or quality of the species. Such a system would greatly facilitate the study of plants by persons who have not the time or inclination to acquire a knowledge of their scientific names. It would save them from many false notions and foolish blunders, and sometimes from fatal accidents. The Ash-leafed Maple will probably adapt itself to more conditions of climate and soil than any American forest tree, and for our Western plains is most desirable. It is one of our most beautiful trees and well adapted for planting on the lawn, in the public park or along the roadside. It is the most healthy of all our native Maples, and freer from disease and less subject to attacks of insects. Its sap rivals in sweetness that of the Sugar Maple, yielding cane sugar in abundance.

Of the Ash, we have three or four species native in Kansas, all of which have a commercial value from the time they are large enough for hoop-poles, and should form a large part of every tree plantation.

The Honey Locust is a fine tree, and would also be valuable for hedges, did we not have the Osage Orange, which is sufficiently hardy here, and is more easily grown and will form a hedge much sooner.

The Kentucky Coffee Tree is one of the most beautiful of our smaller forest trees, and its wood is hard and valuable. It is so easily procured here that it should enter more largely into street and lawn planting than it now does. Few of our native forest trees would add more to their beauty. The Red-bud, which gives our woodlands such a gorgeous appearance in early spring, should be planted in every door-yard in Kansas and be represented on every street and avenue.

Of course those who have come to Kansas from the East like to plant around their homes trees and shrubs which they have been accustomed to see, but when our friends leave the Elm and Maple-lined streets of the Eastern towns and cities, and come to visit us here, they would much prefer to see trees growing that are more peculiar to this latitude; and I believe that our laudable Kansas pride would be more gratified, and our streets and lawns present ultimately an appearance that would please us better, if we would plant out more Ash-leafed Maples, Hackberries, Kentucky Coffee Trees and Red-buds, even if we do not plant less of Elms and Maples.

It is true that the so-called White Elm is "native here and to the manner born," but it does not thrive well away from the streams, and its wood is of little value. The White Elm timber of the East, so strong and elastic, and prized by wagon-makers next to Oak, is not produced by our common Elm, but is the wood of the "Cork" Elm (*Ulmus racemosa*). The "Slippery" Elm yields much better timber than our common Elm, will grow better on the uplands, and is every way a better tree and should be planted in its stead.

The Hackberry is a beautiful and valuable tree. It is well adapted to street-planting, and should also form a large part of the planted forests.

Those species of Poplar known as Cottonwood, are not to be forgotten; for while it is true that in a wooded country they would be of little value, yet in those portions of our country where the question is not, "What species shall we select?" but, "What trees can we plant that will grow?" the Cottonwoods are indispensable, of the easiest possible culture, and of rapid growth. A plantation of Cottonwoods will make more bulk of wood in a given time than any tree that we can plant. In all the older portions of the State it needs little care, and if allowed an opportunity will take care of itself.

Last, but not least, of the trees that we shall mention, is the Red Cedar. If it be true that the Red Cedar is the only native evergreen of Kansas, Nature as usual has made a good selection for us; and if we will make the best and fullest use we can of that tree, we shall hardly miss the other evergreens. For ornamental hedges, for wind-breaks, for the lawn and park, as well as for more strictly economic purposes, it has few superiors anywhere, and none here, where it grows much more vigorously than in the East, and makes a more symmetrical and beautiful tree. It requires so much care and skill to raise evergreens from the seeds that few except professional nurserymen will succeed at the business. But in localities where the Red Cedar grows naturally in abundance, as it does in many places in Kansas, thousands of small trees can be found from six inches to a foot in height. Those trees taken up in early spring-time, and planted out, not too thickly, in nursery rows, and cultivated for two or three years, will develop into fine trees, which may be planted with success.

The Persimmon and Papaw are each worthy of cultivation for their fruit. The Persimmon is properly a forest tree, frequently attaining a large size and great height. From what I have seen of its disposition to "sport," I believe that it has a great future before it as a fruit tree, and that its cultivation, under favorable circumstances, will develop varieties in which its astringency will disappear, and a fruit of great excellence and value be obtained. Both the Persimmon and the Papaw form beautiful trees when growing alone, and are worthy of extensive cultivation as ornamental trees. Our State contains many shrubs and plants valuable for use or ornament, and which are already largely cultivated throughout the East, and which in time will be generally planted here; but of those I will not at this time even mention their names, but will proceed to consider the extent of Kansas forests. According to official reports, the following thirty-four counties had, at the time the Government survey was made, from five to twenty-five per cent. of natural forest: Butler, Chase, Greenwood, Jackson, Jefferson, and Morris, five per cent.; Allen, Anderson, Cowley, Douglas, Harvey, and Woodson, six per cent.; Brown, Chautauqua, Coffey, Elk, Franklin, Lyon, Osage, Shawnee, and Wilson, eight per cent.; Neosho, nine per cent.; Atchison, Bourbon, Cherokee, Crawford, Labette, Leavenworth, Linn, Miami, and Montgomery, ten per cent.; Doniphan and Johnson, sixteen per cent.; and Wyandotte county, twenty-five per cent. The following counties have from two to four per cent. of forest: Harper, Marion, Mitchell, Osborne, Phillips, Ottawa, and Washington, two per cent.; Cloud, Davis, Dickinson, Jewell, Marshall, Nemaha, Republic, and Sumner, three per cent.; and Clay, Pottawatomie, Riley, and Wabaunsee, four per cent. In the remaining organized and unorganized counties of the State, the natural timber is confined to a narrow belt of trees along the principal streams, amounting to not over one per cent. of area.

Forestry in those counties of the State that have five per cent. and over of natural forests, will have to consider principally the preservation and natural increase of the forests they have; for if that amount of land could be kept in timber, and for every tree cut down another one be allowed to grow, and a belt of land on each side of the timber be protected so that a natural increase of the forest could take place, there would be secured in those counties a constantly-increasing area of timbered lands, and the people living there would doubtless find it more profitable to buy their fuel and lumber than to raise it, and the planting of forest trees would be limited to trees for ornament, for shade, and for wind-breaks. All over the Eastern States are farms which, in the eagerness of their owners to become rich, were stripped of their timber, when if a reasonable amount of those farms had been allowed to remain in timber, not only would the climate there have been more equable, but the timber would now have brought a much larger amount of money, aside from the land, than the same number of acres of improved land will sell for.

But unfortunately foresight is not a common attribute of humanity, and the lives of States, as well as of men, are mainly employed in trying to obviate the ill effects of that which should never have been done; and why a Kansas man should clear up his timbered land for the sake of raising corn or wheat at little or no profit, is unexplainable. If it be necessary to cut off the timber from any land where it grows naturally, the land should not be cleared, but be allowed to remain forest land, when in a few years the new growth of timber will be worth more to the owner, and with no expense to him except for protection, than all the grain crops that he could have grown upon it. Let it be distinctly understood, that aside from all climatic benefits to be derived from the preservation and increase of our forests, and aside from all æsthetical or pleasurable considerations connected with them, the land upon which stand the forests that Nature has given to Kansas, are worth more to grow timber upon than for any other agricultural use to which they can be given.

The owner of forest lands in this State should consider it to be a sacred duty that he owes the State and those who may live after him, to protect the forests from destruction. I say a sacred duty, for it seems almost sacrilegious, in a State where we sometimes have high winds, protracted drouths, and scorching sunshine, to cut down even one tree already grown, without providing for the growth of another in its stead.

In those counties of the State that have from two per cent. to four per cent. of natural forest, that amount of timber is really insufficient for the necessary demands of the people for forest products. But even in those counties, as well as the more favored ones, the easiest and most profitable thing to be done is to allow Nature every possible facility, and then let her build up the forests in her own way and in her own time. Nature, we are to suppose, has planted the forests of Kansas in just the best possible place for them to grow, and the next-best place for them is, as a general rule, the land adjoining that on which the trees now grow.

Even in those counties which are destitute of timber, or in which the timber is limited to a very narrow belt of trees along the streams, it will be best, first of all, to take care of and protect what timber there is, and to make provision for its natural increase. This article is written in the faith that along all the rivers and creeks of Kansas, whether they are now belted with trees or not, forests will spring up and increase indefinitely, provided such localities can be protected from fires and the depredations of stock. If such protection could be given with the agricultural development of the State, Nature would give Kansas in twenty-five years all the forests that she would need, with all the incidental advantages that such an amount of forest land would produce.

In support of the suggestions above made, it affords me pleasure to know that the observation and experience of some of the best known and most successful tree growers in the State coincide with my own. In speaking of the Cottonwood, B. P. Hanan, of Langdon, Reno county, says: "Millions of the young seedlings can be had from the sandy shores of the Medicine and other streams"—showing that Nature thickly plants with trees the banks of the Western rivers, which if protected would soon grow into forests. My good friend Hon. Martin Allen, of Hays City, Ellis county, says: "No forest trees are found on the general upland, on account of the fires which for a long time have annually swept over them; but at the head of some of the cañons, and on the dryest and most forbidding spots, *not reached by fires*, the Red Cedar, Red Elm and Hackberry seem to flourish; also the shrubs, black currant, red and white Indian currant, roses, and sumac." Repress the prairie fires, keep the plow, the mowing machine and stock as much as possible away from the timber belts, and not only will the forest that we now have greatly increase, but along the rivers and smaller streams, and in all damp places, forest trees will spring up, and the growth of a few will prepare the way for more, and in a few years timber belts and groves will spring up on every side, and the beauty and healthfulness of the country, and all the climatic advantages that result from an increase of forests, will be enjoyed. The great enemy of the natural or artificial increase of our forests are the fires that are yearly allowed to sweep over the prairies and through the timber. If it be desirable to burn over the pastures and mowing lands, the forests and all places where trees will naturally grow should be protected.

If those counties which are nearly or quite destitute of natural forests are to be settled by an agricultural people, in such numbers as to form a farming community, with farms sufficiently small to admit of having neighbors and schools, and all the advantages and pleasures that flow from social intercourse and country life in pleasant country homes, surrounded with shade trees, fruit trees and flowers, or even if those farms are to produce the common necessaries of life, then in connection with the preservation and increase of the timber already growing, the planting of artificial forests, in a systematic and extensive way, becomes a necessity. But the cultivation of forests will not be successful in a general way, until the Government and the people are fully awake to its importance, and until the business is conducted by intelligent and skillful men, whose foresight reaches beyond the mere present, and who are working to build up for themselves and their children pleasant and permanent homes. The mere adventurer seldom if ever does anything to benefit the locality where he chances to stop; he only destroys what there may be around him, and leaves more desolation behind him than he found.

In forestry, the first thing to be considered is, the place where the tree plantation shall be located. Every person will wish to have around his buildings a sufficient number of trees to afford shade and protection from the winds; and the owner can afford to go to a larger expense to suitably prepare the soil for the limited number of trees that he may desire for shade and protection than he can for a larger plantation, and he may locate his buildings where it may be most desirable. But for the main plantation, the place selected should be the best and most fertile spot on his farm, and if possible, where the soil is naturally moist. We are living in a State where the climatic conditions on the whole are not favorable to the growth of forests, or they would have covered the soil. The rules in relation to forestry that obtain in the more humid climates of the East, are not applicable here; and it is sheer nonsense to think of making a successful timber plantation where nothing else will grow. Land itself is of little value; it is the people who live on it, and the civilization with its attendant blessings that they enjoy, which render land of value. Forestry in Kansas will prove to be no haphazard, make-shift undertaking to be pursued at random on refuse land, but if successful, must be an intelligent, scientific application of the principles of tree life and growth, conducted with a due regard to the conditions of soil and climate, and dictated by a full appreciation of the importance of the object.

Do not undertake too much at one time. Most of the estimates of the expense of raising an acre of forest trees are far too low. To properly prepare and plant out two acres of land with trees in one year, is quite enough with which to commence; and if done in the best possible manner, will give more satisfaction and profit than ten acres of trees on ill-prepared land, cultivated in the usual slipshod manner. While there are some exceptions, as the experiments of the A. T. & S. F. R. R. Co. and others, it may, however, be safely said, that thus far in the history of Kansas, forestry failures are the rule—not from necessity, but from the reason that too much has been undertaken without sufficient knowledge of the natural laws that render success possible, or without sufficient capital to properly carry on the business.

The place for the new forest having been well chosen, the ground should be prepared for the reception of the seeds or young trees, by thorough and deep cultivation for at least one year before commencing to plant. It will not be best to attempt to raise a crop upon the land the first season. Let the soil retain all the humus that the decaying sod will yield; the young trees will need it, and their more vigorous growth will pay you for it.

The ground being properly prepared, shall we sow the seeds in nursery rows, and transplant the young trees, or shall we sow them where we may wish to have trees permanently stand? That the latter method is the better one, seems to be the prevailing opinion in Kansas, and we will not stop to discuss that point. Observing, however, that for many reasons that might be given, the former is the method that the experience of many years of tree planting has led most countries to adopt, perhaps it would be well to combine to some extent the two methods, for one acre of well-prepared soil will raise a sufficient number of trees to plant several acres. A portion of the young trees can thus be transplanted, allowing enough to remain to form the permanent forest.

The primary object of forest culture is to raise timber for future use, and not to afford shelter merely, or to beautify the landscape. So the trees should be grown sufficiently near together to cause them to grow erect and tall, so that from the time the trees are large enough for hoop-poles, or for use in the vineyards, or for fence-stakes, the thinnings of the plantation may be utilized on the farm or will possess a commercial value. The distances between the rows may be four feet; and even if the plantation is designed to be a permanent one, the trees need not be more than one foot apart in the rows. If the soil is as good as it should be to grow a forest, and the trees are properly cultivated and a little care taken to straighten or remove the ill-formed trees, no trimming will be necessary, and every tree will grow into a money-value before they will encroach upon each other. At the first thinning, the trees can be left to stand two feet apart in the rows, then four feet apart; after which, when necessary, an entire row of trees can be taken out. And thus, as the timber may be required for fuel or other purposes, trees can be taken out until they stand eight feet apart in the rows, and the rows in like manner can be taken out, leaving the trees to stand with the rows sixteen feet apart. As trees of different species will thrive better together than if planted alone, it may be well to plant the more valuable species where they can be allowed to remain and form the permanent forest. Where fuel is an object, every other row can be set to Cottonwoods, and abundance of fuel be had in three or four years. The plantation should be cultivated as long as the trees appear to be benefited by cultivation, but it should be done in the early part of the season, so that the trees may thoroughly ripen up their wood before winter. A little well-rotted manure scattered between the rows, just before the setting-in of winter, will keep the young trees from being upheaved by the frost, and greatly promote their growth during the next summer. When a forest of two acres is well planted and nicely growing, the owner, well pleased with his success, and making a wise use of his experience, can prepare and plant more land with even more certainty of success, and the work being spread over a few years cannot fail to afford more satisfactory results, than if an attempt should be made to plant out the entire forest in one year. It will be well in starting a timber plantation, when the young trees can be procured, to occasionally plant in a Red Cedar, not only to break the monotony and to add beauty to the plantation, but also that there may be an abundance of that most valuable timber for farm purposes; and in such places, being forced to grow straight and tall, the trees will be much more valuable than they are when left to grow by themselves. It is a well-known fact that Elms, Soft Maples and Cottonwoods ripen their seeds in early summer, which should be sowed as soon as ripe. It is also well to sow the seeds of those species that ripen their seeds in the fall, as soon as they can be gathered, whether they are sown in nursery rows or in the permanent plantation. Young trees of the Walnut, Oaks, and Hickories, are more difficult to transplant than those of most other species, and in this climate especially, had better be planted where they are to stand; and for the further reason that those species having long tap-roots, that penetrate the soil to a great depth, will be better able to withstand our protracted drouths by leaving their natural roots undisturbed, than they will be with their roots shattered, as is always the case when they are transplanted.

For wind-breaks, especially on division lines of farms, there can hardly be a better plan devised than to plant a double row of Osage Orange, at the joint expense of the owners of the farms. Let a strip of land one rod wide be taken half from each farm, properly prepared, and two rows of Osage Orange be set, with the plants a foot apart in the rows, which may be four feet apart. The land should be properly cultivated for a few years, and the young trees cut back, until the bottom of the hedge is sufficiently thick and strong, and then be allowed to grow at their will. They will soon form an impenetrable fence, and a very efficient wind-break. The rows will effectually support and protect each other, stop the snow, lessen the ill effects of high winds, and form a safe and pleasant retreat for the birds.

The marvelous progress in civilization and material prosperity which the present century has witnessed, has caused a diminution in the forest area of the world, which, if continued, means the complete destruction of forests in civilized countries within a comparatively short period of time. But sagacious political economists in this country and in Europe have already sounded the notes of alarm. In Europe, especially, measures have been adopted that will insure the perpetuity of the present wooded areas. Nearly every country of continental Europe has a Department of Forestry, under the control and pay of the Government, and severe penal laws have been enacted to prevent the unnecessary cutting of forest trees and the diminution of forest lands. Thousands of acres of forest trees have been planted at the expense of the different governments, to prevent the encroachment of drifting sands, and on the mountain-sides to prevent the fertile valleys below from being destroyed by land slides, as well as planted to raise timber for future ship-building and other economical uses. Within a few years forty thousand acres of land have been planted in England with Oak trees, at the expense of the Government, and their care provided for, that the State a century hence may not want the means for keeping up her navy. It is one of the incidents of freedom, that in this country very much is left for the good sense and public spirit of the people to do, that in other countries is done for them at the public expense. And it is difficult to see how National or State aid can effect much for forestry, except in a general way. The "timber acts" of Congress might as well not have been passed, for any good that they have done, or will be able to do, as they now exist. Very much, however, can be done that will lead to the better protection of the forests that we already have, and to encourage and promote the planting of forest trees, by means of State and local "Forestry Associations." Minnesota has a strong and efficient organization of that kind, and though established in 1876, through its instrumentality, aided a little by the State in the way of premiums, millions of trees are now growing upon the prairie lands of that State that otherwise would be treeless. In a single county of that State nearly two millions of forest trees were planted in one year, nearly three-fourths of which were growing at the end of the season. Several of the States have "arbor days," on which the planting of forest trees is made a specialty; and the setting apart of these special days for tree planting has probably done more to create enthusiasm in relation to forestry than any other plan that has been devised. Kansas should lose no time in organizing a State Forestry Association, or her State Board of Agriculture should resolve itself into a committee of the whole for the consideration of the subject. County agricultural societies should offer premiums for the best acre of forest trees planted out and in successful cultivation, and for the largest number of trees planted out by one individual and kept alive during one season; and farmers' "clubs" and "alliances" should discuss forestry in all its branches, as to what varieties of trees are best to plant and when they should be planted. All public grounds in the cities and villages of the State and their streets and avenues, not already planted with trees, should at once be planted with them. The inhabitants of every school district should see that their school-house lot is fenced and planted with trees, and the children educated to protect and care for them.

Trees are objects of beauty in themselves; they refresh us by their shade, sustain us by their fruit, delight us by the beauty and fragrance of their flowers, and protect us from the fury and inclemency of the elements. Forests mitigate the heat of summer and the cold of winter, restrain the fury of the winds and regulate and equalize the distribution of the rainfall. Without the present forests of the world and the fossilized remains of those of past ages, the busy wheels of the thousand industries of civilization would soon stop, and the earth become a dreary and uninhabitable waste. Forestry is to-day the paramount interest of Kansas, and if this young but already great and grand State is to continue that career of growth and prosperity that has rendered her name a household word and her territory a land of promise to the immigrant the world over, it must receive the fostering care and aid of all her people.

FOREST CULTURE IN KANSAS A NECESSITY.

BY J. W. ROBSON, CHEEVER, DICKINSON COUNTY.

It is with extreme reluctance that we indite this paper. We have written so much on the subject of timber culture during the past forty years, that we fear we cannot bring forward any new argument to use as an incentive to urge our rural population to plant trees for shade, protection, profit, and to beautify the landscape and their homes. The sufferings endured by our people in western Kansas this present winter — to say nothing of the losses sustained during the spring of 1880 — should be incentive enough, and arouse every one of them to immediate action the coming spring.

The title deeds which we farmers hold to the broad acres of this old Mother Earth give us no moral right to render them unfit for habitation for ourselves, or for those who are to follow us. Nature has formed all things well, if we would only profit by her lesson, even when she made these vast plains. One-tenth part of our farms covered with timber, planted in belts, would furnish us an abundant supply for every conceivable purpose for which timber is needed on the farm. The remaining nine-tenths will furnish more of all the necessaries of life, and that with far more uniform certainty, than the whole surface would produce without the protection of one-tenth in timber belts, to say nothing of the protection which would be afforded to man and beast. We would here offer a few cogent reasons why every man who lives on an upland farm should plant timber:

I. To those of us who have chosen our homes on these treeless plains, it is a binding duty that we owe to ourselves, to our State, and to our children.

II. Timber culture is no longer an experiment with us, but, with care, a certain and complete success.

III. The protection afforded by shelter belts is worth far more than the rent of the ground on which the timber stands, to say nothing of the benefits arising from the thinning-out of the trees, for fuel, etc.

IV. It renders a farm so much more beautiful and attractive as a home, and so much more valuable if we ever wish to sell.

V. One can hardly look on those thrifty groves, with their cool shade in summer and protection from piercing winds in winter, without a feeling of self-conscious satisfaction that he has done one good thing for himself, his State, and his posterity.

With these facts before them, the farmers of this State have every inducement to go forward in the work of planting trees. Our Legislature is giving liberal appropriations to secure this end. Our State Horticultural Society is giving, and giving most earnestly and abundantly, all the benefit of her great experience; but its strongest and most earnest advocates to-day are to be found scattered all over our broad commonwealth, who are in house, barn, orchard and field, surrounded by the protecting influences of groves, hedges and belts, and know their full value in summer and winter. A high state of civilization and an abundance of timber must ever go hand in hand, and it is a hopeful sign of the times that the whole of the prairie States are moving in this direction. Kansas as a State must move with the current, if she would maintain her present proud position.

TREES SUCCESSFULLY GROWN IN KANSAS.

GREEN ASH.—For fuel and for all the manifold uses for which light, firm, elastic and durable timber is wanted, as well as handsome, light-colored finishing lumber, the Green Ash is one of our most valuable trees. Its growth is rapid when grown on a deep rich soil. We have found it indigenous in every part of Kansas that we have visited.

ASH-LEAFED MAPLE.—In popular parlance Box Elder. This is one of the easiest of all to cultivate. For great amount of fuel in a short time from planting, it has no superior. In Illinois it is being planted for sugar making. Its wood in the older States and in Europe is used in cabinet work. This tree and the Green Ash are excellent for shelter belts, as their roots do not stretch out far and *"eat up the soil."* The seeds of both are ripe in October, and are easily gathered, as they grow in bunches. They should be sown in the fall, in well-prepared ground, as for corn. To keep the seeds over winter, place them on a hard, elevated surface, putting a box over them, and cutting a trench around the box to keep water from running under them.

HONEY LOCUST.—On account of rapidity of growth and value of timber for fuel, posts, furniture, etc., we regard this native tree as very valuable. The idea seems to be common that this tree, like the common Black Locust, is liable to sprout from the roots, and is also subject to attacks of the "borer." For the benefit of this quite numerous class, it will be well to state that both ideas have no foundation in fact. The seed ripens in September. Sow in spring, near corn-planting time. Before sowing, scald the seed severely, by pouring boiling water over them.

ELM, (Red and White.)—These two trees are beyond all question hardy, even in the most exposed positions. In rich soil they grow with great rapidity. They are, as far as our observation goes, entirely free from disease and insects. Grown thickly in artificial groves, they run up straight and tall. For isolated trees for shade, for avenues, or for group-planting for landscape effect, they are not excelled by any native tree. Michaux was right when he said that the White Elm was "the most magnificent vegetable of the temperate zone." This special commendation of these two trees may be received with some doubt by those who have given the matter but little attention. We do not wish to convey the idea that exclusive plantations be made of any one tree. But example and fashion have too much influence in guiding tree planting. The Soft Maple, for instance, became, years ago, the popular tree for general planting all over the eastern portion of our State. Let us suppose that the Elms had been the popular trees: how different would have been the face of the landscape there to-day! The seed of the Elms ripen in May. Sow at once, in a moist, shady spot. Plant out the trees next spring, preserving the tap-root.

HACKBERRY.—This native species grows very rapidly after the first year. The fruit should be gathered in October and sown at once, and by all means sow where wanted in the grove.

BLACK WALNUT.—This tree is too well known to need any description here. Gather the nuts as soon as they fall, after the first sharp frost in the fall. Plant them with the shucks on, in the grove, RIGHT OFF, where you want them to grow. Should not be planted in single rows or in shelter-belts. Transplanting, even at one year old, injures the growth of this tree.

CATALPA SPECIOSA, AND TEA'S HYBRID CATALPA.—We have no experience with these trees, but the experience of others fully demonstrates that these two new forest trees are as hardy as any of our native trees. They ought to be tested in every portion of our State.

EVERGREEN TREES.—The number of these adapted to the climate of our State are not very numerous. The Scotch Pine is easily transplanted, grows rapidly, and makes a strong, spreading tree. The Austrian Pine is every way a denser-growing and finer tree than the Scotch, and as a screen, is impenetrable to the wind. The Red Cedar is a tree of more moderate growth, but is valuable in a shelter-belt. Avoid large trees of all of these three for transplanting. Choose sturdy growths one foot high, thrice transplanted. Plant early in the spring, mulch when planted; continue mulching for years, and success is certain.

PREPARATION OF THE GROUND.

The best method is to prepare the soil precisely as we would if we were going to raise a large crop of corn. Plow deep and harrow well. Mark with corn-marker one way, and the ground is ready for receiving the trees.

PLANTING.

One or two-year-old trees do best to transplant. Open up the first row with the plow, making a deep furrow, and every third row afterwards, till the whole is finished; then with a spade clear out the furrow a little deeper every four feet. While a man handles the spade, a boy can carry and handle the trees. Tread the soil firmly around them in planting. The two vacant rows can then be planted with Cottonwood cuttings. Alternating the rows thus with hard and soft-wood trees is an advantage in securing a better growth for the hard wood. The latter grows more swiftly, and run up and shape themselves into tall, symmetrical trees. The former growing more rapidly, act as nurses, and protect the hard-wood trees from the storm.

CULTIVATION.

Passing the cultivator between the rows three times during the season will be sufficient; the same culture the second year; the third year (if the trees have grown vigorously) the plantation will take care of itself; at the end of the fourth year begin to thin out the Cottonwoods. Judicious thinning of hard-wood trees after six years' growth, must also be attended to.

TREES DISCARDED.

Ailantus, Catalpa bignonioides, Black and Yellow Locust, Lombardy Poplar, Larch, and White Willow; Evergreen trees—Balsam Fir, Hemlock Spruce, Norway Spruce, White Pine, and Arbor Vitæ.

OBSERVATIONS.

We observe in our journeyings throughout the State, that those settlers who planted shelter-belts and groves are fixtures on their farms, while those who never planted a tree have pulled up stakes and gone elsewhere, and others of the same class are still going. Home attractions are lacking.

We notice always that trees are an ample protection from the most violent storm. While a northwest blizzard is howling in frigid fury across the open prairie, piercing the many wrappings of humanity, it is pleasant to have the homestead safely anchored on the southeast side of a dense grove.

We observe that our domestic animals appreciate the shelter afforded by trees. How often do these storms sound the knell of death to these in exposed situations, and how slow the average farmer is to learn that the only way to moderate these storms, which everyone deprecates, is to plant trees.

We notice everywhere throughout this broad commonwealth, that plantations of trees effectually protect the garden, the orchard and field crops. This question was settled most conclusively during the spring of 1880. Sleet-laden branches were snapped by the billows of the wind. The tender inflorescence was chilled to death. The garden planted by the careful housewife was swept bare by the drifting winds, and the cereals sown in the fields were whipped and ruined irretrievably; and all this and more, because good sturdy trunks and stout pliant branches were not put in the ground years before to wrestle with the mighty winds and wrest from them their destroying power. Give us timber belts every half-mile, good solid hedges every eighty rods, and then the Kansas farmer can laugh at the impetuous cold of the northwestern storm.

We have observed, also, that trees are conducive to health; one of the most important functions which trees perform, results from their taking up carbonic acid from the air and soil. When trees are exposed to the action of sunlight, a series of chemical changes are brought into play which are essential to their life. The carbonic acid of the air will be decomposed by the *green* parts of the surface of the plants, and the solid carbon will be *fixed* within its tissues, while the oxygen, (the health-giving gas,) will be set free, to restore the purity of the atmosphere.

The work before us is imperative. We must set the energies of the State in motion; we must appeal to all the land-holders of the country, and demonstrate to them the profits of *timber culture*. We must tell these men that the protection afforded to their farms and homes by these timber belts amply repays them for the outlay. Nay, more; tell them when every farm in the State has its own forests, our fountains of water will increase; that drouths will be less frequent, the heat less intense and cold less severe; depressing winds and unhealthy vapors will cease; the hurricane will be tamed, and the destructive gale hushed to a gentle breeze; and especially of the coming want and suffering, if timber culture is neglected.

We must awaken an interest in railroad corporations: Tell them of their future wants for ties and trestle-work; of the thousands of miles of railroad in this State alone, with nearly ten million ties, which will nearly decay in ten years, and new ones must be substituted. Tell them that ten sections of land planted with Catalpa Speciosa will produce enough ties in twenty years to re-lay every railroad in the State—produce fence posts abundant for their use, and yet leave a forest remaining on the ground that will supply their wants for a century. Collect statistics, facts and arguments, and scatter them broadcast over the State. Let every agricultural, political and religious newspaper in the country teem with information; let societies be organized for the promotion of timber culture in every township in every county of the State; let every address on agriculture or horticulture enforce *this* as the leading question of the day; let there be a professor of *forestry* in the industrial college of this State, to train young men in this science, and let no one be eligible to receive graduating honors until he is thoroughly instructed in this department. Let us keep sending our delegates to the Legislature, so that Senators and Representatives may be awakened, and instructed to aid this beneficent enterprise, by all reasonable legislative acts.

To every tree lover we would say, gather into your grounds the beautiful as well as the substantial—every tree that is "good for food and pleasant to the sight." Instruct your fellow-citizens everywhere, always accompanied with stirring facts and appeals. Find the avenues to the pride, the ambition, and to the hearts of all, who have or would have a home.

Such, then, is part of the work that lies before us. Let us gird ourselves afresh for the work, and trusting in the favor of Heaven and the correctness of our principles, go forth with increased zeal to beautify and enrich our noble State.

FORESTRY.

BY REV. J. B. SCHLICHTER.

It might be said by some, that a clergyman giving time and attention to forestry, is stepping aside from his calling. Father Abraham was a patriarch, a successful preacher of religion, a traveler and explorer, a very large stock raiser, and a very successful and practical horticulturist—for it is said that he planted a grove in Beer-Sheba, a place still noted for its wells and pasture fields. If every priest, or Levite, and family in Israel had followed his example after they came into possession of the land, Palestine to-day would be vastly more fruitful; there would be less drouth, less famine, more springs and brooks; and there is a possibility that to-day steamers might be running from Gibraltar to the Sea of Galilee, by way of the Isthmus of Suez. If the ministers of to-day would make short journeys daily to the garden and the orchard with the hoe and the pruning-hook, they would not need to make such long and costly prilgrimages annually to the seashore, to Europe or Palestine, with broken-down constitutions; and if they were to enter their studios, refreshed and invigorated with wholesome bodily exercise, with the smell of the rose, the apple and the aromatic herb, and then imitate their divine Master in giving their people parables about the vine and the fig tree, or the lilies of the field, their people would be served with better and more wholesome spiritual food.

Forestry is becoming a question of national interest. It is a fact that the great forests of the United States are rapidly disappearing. Where will coming generations get their timber? How will this network of railroads be supplied with ties, which must be entirely renewed once within every decade? Whence shall come those harder and tougher timbers from which to manufacture the implements of agriculture and household furniture of coming years? These are grave questions, but there are graver ones involved. The cutting away of the great forests from the shores of our inland lakes, in Michigan, Wisconsin, Minnesota and the Dominion of Canada, must in the course of time bring about serious climatic changes. Already in the older portions of these and other States, where the inland forests have been cleared away, the running streams have materially decreased their volume of water. When once these towering pines shall be no more, and the bleak winds shall sweep down from Labrador and the Arctic regions upon our great river valleys and upon the rich lands in Ohio, Indiana and Michigan — when once that great mountain chain, stretching from Vermont to Virginia, shall be shorn of its perpetual green — when once all the Southern pines shall disappear, from the Carolinas to Texas — when once the great tide of emigration now moving out into our new West, and the numerous railroads about to penetrate the Rocky Mountain regions, shall lay waste those vast mountain fastnesses and timber slopes, (for most certainly every available stick of timber in these mineral regions will very soon be in demand for mining purposes,) — then, if every available piece of ground on the continent shall be put to the plow, and the hot winds shall begin to blow upon the inland lakes and the numerous water-sources, shall we see, not the abomination as prophesied by Daniel, but desolation "standing in the place it ought not;" and it may even come to pass that the Niagara shall cease its loud roaring, and the great Mississippi refuse to carry its freighted wealth. This is not all theory nor all poetry. What must be the inevitable result when the wind that wafts the moisture inland from our sea coasts shall have to pass over an uninterrupted, treeless plain, before it reaches the upper water-sources and reservoirs of the North? There would then be less rain and less snow there. And what if there would be less rain and less snow there? There would be less water in our rivers and lakes. What if the rainfall or snowfall on the Rocky Mountain slopes should be greatly decreased? The water in our streams and lakes must become proportionately reduced. We have already learned that we can with precision foretell a drouth on these Western plains by the absence of snow in the mountains. If this snow-fall should be decreased by the cutting away of forests in the mountains, then we can already know how it will affect, for example, the Arkansas river and its rich valley lands.

To counteract the climatic influence the cutting away of forests has upon our continent, there must be forests planted. Especially ought this to be done on our Western plains, where the land is vacant and void of timber, and where the tributaries of some of our great rivers take their rise. This would very materially enlarge the present channels of those streams. We can conceive how these streams might in course of time become navigable far inland.

The more recent explorers in Palestine seem to be of opinion that the Dead Sea was formerly (in Abram's time) much larger than at present; that the cutting away of forests along the Jordan and the other tributaries that flow into this sea so reduced the water, that the influx was not equal to the evaporation, hence the sea level is lower than formerly. If this view be correct, then the same might eventually come to pass with regard to our inland lakes and river-courses. It is even now true, that in the western portion of our continent where timber is scarce, there are streams sinking away and entirely disappearing; and others empty their waters into lakes that have no visible outlet. If these sparsely-timbered regions of the West shall be entirely stripped of their forests, and none planted to take their places, then we may look for consequences here in Kansas that are, to say the least, very undesirable. To protect ourselves — and especially the generation coming next in its course — against these consequences, let us plant trees for shade, for fuel, for wind-breaks, for hedges, and for fruit, and coming generations shall have the reflex benefit of the climatic changes these shall produce.

The only hope for the agriculturist in western Kansas is a modification of the rainfall, which it is claimed the cultivation of the soil shall produce; but the sooner people will rid themselves of this delusion — that mere cultivation of the soil will induce more rainfall — the better.

It is time to wake up the farmers on this question. They have altogether too little regard for trees. In Ohio some of the farmers are digging up their apple orchards and throwing the trees out over the fence, because they can make more money to the acre by raising wheat than by growing apple orchards. I mention this fact to show what kind of a spirit pervades farmers in general. They will cut away every vestige of a tree to make room for corn, or wheat, or tobacco, where they find out that these things bring the best returns. In Connecticut and Massachusetts, outside of the natural forests, we find more forest trees in the suburbs, and villages and towns, than in farming communities. These have been planted mostly within the recollection of the oldest citizens, and largely during the present generation, and today some of these towns are almost a dense forest, the trees towering up and spreading their great branches out over the buildings, and interlocking each other above the streets. These are mostly Elms and Hard Maples. In New Haven the largest Elms are about seventy-five or eighty years old; they are planted about forty feet apart, and their great branching tops form a complete arch above the streets. At Greenwich, Connecticut, I measured an Ailantus tree planted about thirty years ago, that measured six feet in circumference, at two feet from the ground. But these trees are generally grown either in the villages, suburban towns or smaller cities, or by amateur farmers. Very few of the ordinary farmers in the East feel that they can give place, except on the very rocky soils, for a single tree that may interfere with the growth of field or garden crops. In some of the hill towns of New England, farmers have been driven, by necessity, to give their farms over — being literally worn out — to whatever may grow spontaneously, and of their own accord they are yielding a valuable growth of young timber.

But it needs no long argument to prove that farmers in general do not give sufficient attention to horticulture and forestry. His first business when he enters upon his homestead in a timbered country is, to clear away the forest; and every tree, of course, must yield to the ax, except what he may need for fuel and fencing during his own existence. This grown for fuel and fencing is usually at the very furthest point from his building. How much it might add to beauty and comfort, if he would leave here and there a clump of small trees to occupy some corner of the field, as well as a larger clump about his building, with only the larger ones, that might endanger his building by falling, being cut out. It would further be an advantage to leave here and there a small tree along the fence lines; and with proper taste in this direction, every farm might really assume the appearance of a park.

When the farmer enters upon the improvement of a prairie farm, we notice the same disregard for tree culture. He is so apt, in his hurry and bustle to plow and plant, to forget that one of his very first interests should be to plant trees; to surround his cabin with shade and comfort; to line his fields with timber belts; to plant here and there clumps of trees or single trees for shade, ornament, and for fuel.

The State Legislature and the General Government could well afford to hold out special inducements, to give special assistance (I don't know just in what way) to encourage the farmer to plant groves. If such groves were forever exempt from taxation, it would in many instances be a sufficient inducement; or, the General Government might institute a Forest Commission similar to the Fish Commission, and appoint, perhaps, a commissioner in each county or Congressional district of the settled portions of the Western plains, furnishing means to carry on an experimental forest garden, furnish him with a limited supply of tree seeds for distribution among the settlers, confining this distribution to such as have already shown some degree of interest and skill in this branch of horticulture, and also to such as will pledge themselves to undertake forest-tree culture. This distribution should at first be in limited quantities and of such varieties as are known to be suitable to the climate. Then, after the first year, larger quantities could be given to those who report success.

Now this whole business could be committed to the different State Horticultural Societies, which, with their system of county *vice* presidents, could have the whole matter under its direct supervision. These *vice presidents* are usually men who are experienced in tree culture and are already engaged in making practical experiments, and they would gladly extend these operations, if they had the capital to do it with. By the aid of a small appropriation from the General Government and also from the State Legislature, it could bring about a great revolution on these plains.

This work is too ponderous for single-handed, poverty-stricken farmers to undertake alone, especially when the different railroad incorporations own half of the land. It would certainly be to the interest of the railroads to encourage this enterprise, and ship free all kinds of trees and tree seeds that are to be planted along their lines of road. It would be even to their interest to plant large groves along their main lines for the purpose of replenishing their ties in the future. Of course, the Government did a good thing when it instituted the present timber act, granting a quarter-section of its domain to any one who will plant and cultivate ten acres of timber; but it does look a little close-fisted on the part of the Government when it could not allow more than one such claim to be located on a square mile. Was it afraid that there would be too much land put out into timber? And what shall we say about the framers of the first act, requiring a man to plant forty acres of timber to secure 160 acres of land? Were they insane? We must make allowance for their ignorance concerning the difficulties to be encountered in growing timber on these plains. The present act is a great improvement over the former; but there should not have been any limit as to the number of timber claims located on a section. In fact, forty acres of timber on every quarter-section, properly distributed in timber belts, would be not too much timber for these plains; but in that case, the occupant would have to have a premium on all that he cultivates above the ten acres, else he would pay too dearly for his land.

Let me say right here, that after all, this timber-claim business is practically a failure, not because the act is faulty, but it is just what we might expect from past experience. How few farmers in the East, where everything is favorable to growing trees, can show a three-acre apple orchard that is a complete success. How many forest trees for shade and ornament does the average farmer in the East plant and properly cultivate? From one to six. The average farmer in the West who enters a timber claim is no better than the average farmer in the East. At this rate, or at the rate actually shown by observation, how long will it take to have respectable groves dotted all over these prairies?

Could the Government really expect that more than one out of every ten farmers who take claims under the timber act would ever get five acres of timber successfully growing on these plains, where the climatic influences are so much against them? It must be remembered, also, that many of those who have taken claims under the timber (and homestead) act are persons who have never farmed before, and know but little about tree culture. For example, a certain man of the medical profession took a claim, and, considering it all folly to plow these nice, smooth, rich prairies, for the purpose of tree growing, took a crowbar and punched holes into the sod, and dropped the cuttings into these, and then wondered why they failed to grow.

Another man, of the clerical profession, a *little* wiser than the doctor, broke his sod, planted it with corn, and then, with an ax in one hand and some cottonwood cuttings in the other, he went through his patch, and speedily he had the required number of acres set out, (according to law, of course,) twelve feet apart each way.

Another example: And this time it was an experienced farmer from Missouri, who walked over his wheat field in the spring when the ground was soft, and with his hand punched his cuttings into the soft earth about every twelve feet, as near as he could guess; then after harvest one Sunday afternoon, taking his lady by the sleeve, they both walked out to see how their trees were doing, anticipating what a fine time they would have sauntering about under their spreading branches; but, alas! it was with the utmost difficulty that he, with his spectacles on his nose, and she, with her sharp eagle eye, could find any trace whatever of either root or branch, and of course he cursed the heathenish harvesters for so ruthlessly destroying his timber.

I know of another example: A *"blue-bellied"* Yankee, from the hills of Vermont, who planted his trees among his oats, with a similar success, only he did not go out after harvest to look at his trees, supposing, of course, that when *once* planted they did not require any further looking after.

Only a very small per cent. of those who have undertaken to grow timber under the timber act have actually succeeded. But the few who have succeeded have demonstrated that timber culture can be made a success, but at the same time also claim that it has cost them too much. There is no question but that the outlay in managing a timber claim on the western plains of Kansas anywhere west of the ninety-eighth meridian, strictly according to the requirements of the law, is altogether beyond any returns that any man of advanced years may ever reap from the use he may make of the timber itself. His principal reward will be in the protection and beauty it affords him. But in this he does not share the reward alone; all his neighbors share it with him, and the land bordering on his own, whether it belongs to private individuals or to railroad incorporations, is enhanced in value. Hence such who are thus faithfully planting and cultivating groves must be esteemed as public benefactors. But this single-handed fight by the insignificant few who have the courage and perseverance to undertake and prosecute it, against the ordinary winds, the fierce hurricane, the blasting simoon, the beating hail, and the myriads of devouring vermin that visit and infest these climes, is too stupendous to be thought of by rational men, without some governmental backing or other basis of operations besides their own feeble resources. I repeat it again — this is a national question; it is larger than any single State should undertake. Every tree a man plants on these prairies is a benefit not only to his neighbors, but to the public domain.

If, then, these things are so, that cutting away forests decreases the rainfall, and planting forests increases it; if denuding our land of forests brings upon us cyclones, water-spouts, destructive floods in one place and burning drouth in another, and a general confusion in nature's arrangement in the rainfall — then it is quite evident that the public weal or woe is involved in the forestry question. Therefore if we would perpetuate the present condition of things in nature's arrangement, we must at once cease to cut down our forests. Or if we would bring about a better or improved condition in those treeless plains of our domain, we must plant forests on a much larger scale than that of private individual enterprise. If we would ward off the undesirable conditions that are silently but surely crouching upon us, we must plant trees at least sufficient in quantity to keep pace with the present rapidly-disappearing forests from our continent.

FORESTRY CULTURE.

BY M. ALLEN, STANDING COMMITTEE, HAYS CITY.

In making my first report on forestry, I have to confine my remarks chiefly to the western part of the State, where the great work in that line needs to be done.

West of the 99th meridian of west longitude, timber is by no means plenty —whole counties are there to be found without sufficient timber to supply firewood alone, for a single year, to their present inhabitants. The past two years, especially 1880, have been very dry, so that new plantations have mostly failed to grow; and older, well-established groves have grown but little, yet wherever they have been reasonably well cared for are in good condition, ready to proceed with the work of making timber as soon as circumstances again become favorable. Under such a pressure of drouth as we have just passed through, I doubt if any trees could have survived on the soils of the eastern or middle States. For forest growth our soil is the very best; our atmosphere is not good, but on the average, annually growing better, and is susceptible of vast modification and improvement.

Some of our people are discouraged by this failure in forestry, but the greater number, having more faith, are proceeding with the planting; but few, however, seem to know the requirements necessary to produce success, or the sorts to try. Cottonwood is being planted more than any other. This is well, as it is not only a good pioneer tree, but a native, and easily procured. The Black Walnut, Red Elm, White Elm, Green Ash, Hackberry, and Box Elder are also natives, and each of them (the last named only excepted) seem to be more enduring than the Cottonwood, and therefore their culture ought to be encouraged and extended, not that they may be expected to grow so rapidly, but that when once established, they have great tenacity and hold their places well.

The Catalpa, Black Wild Cherry, Black Locust, Ailantus and Silver-Leaf Poplar are all promising well here in the West, the first three named being more especially valuable for the superior quality of their timber, and the last three for their inveterate sprouting. They should always on this account be planted in the central part of a grove, where they could not easily extend their roots to adjacent lands. When once fairly established, they will be found very difficult to eradicate; therefore, never plant these three sorts where it is at all likely that you might sometime want to plant something else.

The Honey Locust and Osage Orange both thrive here, and after being well started, seem to bear neglect as well, if not better, than any others. If seed of these two sorts be planted reasonably thick in the row, and cultivated one or two years, and the more feeble plants cut out, the stronger-growing ones will be hard to destroy, even by the most severe neglect. Good culture, however, will always repay with these trees, as well as with all others, in their more rapid growth. Under the most slovenly neglect, these two trees have another element of success—that is, they afford their own protection from stock with their own terrific thorns. For quality of wood, the Osage Orange has no superior; for low wind-breaks it is first-rate; and for hedges it seems to be without a rival. It is fortunate for the treeless part of the State that this valuable tree is promising so well.

Trees are much needed for ornament, shade, wind-breaks, firewood, and other purposes too numerous too mention; and in the subject itself, there ought to be a sufficient stimulus for all to plant. The mere ornament they afford should be a sufficient impulse to the more refined and tasty; the shade they furnish ought to be an incentive even to the sluggard who may want to repose securely from the rays of the scorching sun under their branches. Political economists ought to plant trees on account of their general usefulness. In fact, this is a duty that no land-owner ever should fail to perform, because in no way can the use, beauty or selling value of a piece of land be so cheaply enhanced as by judiciously planting trees and caring for them. This is work that true "patriots" will not omit.

FOREST-TREE CULTURE.

BY DR. G. BOHRER, RAYMOND, RICE COUNTY.

G. C. BRACKETT, *Secretary:* In compliance with your request, I cheerfully place at your disposal what observation and experience have taught me in regard to timber culture.

First, it is a fact admitted by all who have acquainted themselves with the results of stripping a country of its timber, that the consequences are deleterious to its agricultural and horticultural productions — it having been demonstrated beyond all doubt or question, that a country destitute of timber belts and groves, gives the winds free access to all kinds of field, garden and orchard crops, and hastens the evaporation of moisture to a degree not only unhealthful, but in many instances positively ruinous to them. This being the case in countries where timber has been removed, it necessarily follows that the same result must attend the cultivation of all crops in a region of country where timber never existed. This, it seems to me, demonstrates the indispensable value of timber on our prairies; and if this be true, it is but a question of time when the country will be reduced to a desert, and consequently will be uninhabitable by man.

But secondly, it is well known that there are many acres of very fertile soil in some portions of the State, which, as soon as the sod is broken and the grass roots decomposed, begins to blow away from the roots of crops. This, again, suggests the propriety of protecting such lands by having them heavily skirted with timber, for without it they are sure to become worthless, but if protected they are among our best crop-producing lands.

To be brief, I deem the matter of timber belts of so much importance to the development and future prosperity of the State, that our State Legislature should compel them to be planted, cultivated and protected.

As to the kinds of timber to cultivate, I will state that for wind-breaks, especially along our public highways, I would advise the selection of timber of dwarf habits, for the reason that such timber, when fully grown, will not be blown down by high winds into the roads, nor will they shade growing crops so badly as large trees.

The Box Elder will answer a good purpose. It is hardy, and less subject to injury or destruction by insects than many other varieties. Even the grasshopper or Rocky Mountain locust injures it but little, if any. This timber I would grow by collecting the seeds in the fall after one or two frosts; and as mice are liable to eat them if planted in the fall, I would keep them in a sack, suspended where mice cannot get to them. In the spring, about the 1st of May, plant them in rows, six feet apart, and not more than one inch deep. They will come up as soon as the spring rains begin to fall.

Cultivate, and keep free from weeds for four or five years, after which they will take care of themselves.

For wind-breaks away from the highways, plant Walnuts the second year, half-way between the rows of the Box Elders, so that in the course of time the Box Elders may be removed for such use as the owner may have for them — leaving the Walnuts to make stately trees.

The Ash timber peculiar to our plains, along the streams, will also prove very valuable timber, and is reasonably hardy. It should be planted and managed after the manner recommended in the case of the Box Elder.

The hardy Catalpa (Speciosa) is highly recommended for its rapid growth and timber qualities; but I leave others to speak more fully of it and other timber trees.

FORESTRY.

BY E. T. BYRAM, JEWELL CITY, JEWELL COUNTY.

In looking over the "First Report on Forestry for 1879," I am at a loss for something to add to what I find there. It seems to contain all that I know, and a good deal more. Therefore, being a Methodist, I will try and follow up what has been so well said, with an exhortation.

If I could reach the ear of every farmer living on a quarter-section of prairie land in Kansas, I would urge him by every consideration of comfort, health and pecuniary interest, to prepare *at once* for a grove of forest trees; and I would keep urging him till he would go to work in earnest. How any man can live out on the bleak prairie for six or eight years, and make little or no effort to get even a wind-break of trees around his house or stock-yard, is past my comprehension. It is not so much a want of knowledge as a want of interest, and that most ruinous of all habits, procrastination. The farmer is not quite ready now, and he puts it off till next year; next year he is as little prepared as now — and so it goes on till life is past and nothing done. Let no one bring as an excuse, that he can't get the seeds, or cuttings, or small plants that he would prefer, but go to work at once and plant whatever is most convenient. Any of the streams near by will furnish an abundance of seeds of the Ash and Elm or Box Elder; and poor as it may be for other purposes, there is nothing to compare with the Cottonwood for rapid growth. It makes good fuel if cut early in the winter and well seasoned. From what I have seen, I fear the Walnut will hardly succeed west of the sixth principal meridian, unless planted on rich bottom land. It may, but it will take a life-time to become available for mechanical purposes. Let no man waste time with Black Locust. It grows rapidly, but before it is available for any useful purpose it will inevitably fall a prey to the borer. How well I remember our beautiful Locust groves in Illinois, planted about forty years ago, and from which we expected so much. Many of them had grown large enough for fence posts, but were all utterly ruined in a year or two, as if a fierce fire had passed through them; and from what I saw of it in Jefferson county, it is still less likely to succeed in Kansas.

I have what is called a timber farm, that furnishes plenty of fuel, and timber for other purposes on a farm, so that I have no need for an artificial grove, but I have good wind-breaks for my orchard. I think if I should wish to plant a grove, I would plant largely, fully one-half, of the Ash, so common along the streams in this part of Kansas, and on west of here to the State line. It grows rapidly on bottom or good upland, and is much better than almost any other timber for fuel, besides being valuable for mechanical purposes.

In planting a grove, I am satisfied there is a great advantage in planting alternate rows of different kinds of timber; plant in rows not less than eight feet apart and as close in the rows as you please—not more than three or four feet apart; I have seen the finest Cottonwoods growing not more than two feet apart. I would set the cuttings and plant the seeds where I wish them to stand, without transplanting, or at most would only transplant so as to thin out the rows, and in this way extend the grove. Prepare the ground and cultivate the plants as thoroughly as you would a piece of corn that you intended to enter for a premium at the county fair. This can be done with a single or two-horse cultivator, and hoeing, and must be followed up for two or three years; after that mow the weeds twice in the season, leaving them on the ground for mulch till the trees are large enough to smother them out. Mulching trees with old hay, straw, etc., is of the greatest importance, when it can be done so as to effectually smother the weeds. But it is utterly useless to try to raise trees, either fruit or forest, in Kansas, without thorough cultivation or mulching, or both.

And now for a little more exhortation: Plant trees—plant lots of them; plant for beauty; plant for comfort; plant for profit;—and succeeding generations will bless you.

FOREST-TREE GROWTH.

BY J. J. MEASER AND W. R. PENNINGTON, HUTCHINSON, RENO COUNTY.

The following are the results of forest-tree planting by these reporters, made March 1, 1881.

Lombardy Poplars, set from slips in the spring of 1879, now average two inches in diameter, and twelve feet in height; Catalpa Speciosa, one-year seedlings, set in spring of 1880, average five and one-half inches in circumference, and six and one-half feet in height; White Elm, one-year-old seedlings, set in spring of 1880, are three and one-fourth inches in circumference, and five feet in height; Sycamore, same age of Elms, three inches in circumference, and four feet in height; White Ash, from seed, one foot in height; Honey Locust, one year old, from seed, eighteen inches in height; two years old, three inches in circumference, and eight feet in height; Russian mulberry, three years old, four inches in diameter, and ten feet in height. This mulberry is hardy, a good grower, and if kept in dwarf form will make a fine hedge and wind-break.

EVERGREENS.—Of Red Cedar, set in the spring of 1880, ninety-five per cent. made a successful growth.

The soil on which the foregoing-mentioned plants were set is a sandy loam, which is supplied with moisture by sub-irrigation from the Arkansas river on the south, and Cow creek on the north; distance between the two streams, about three miles. The depth from surface of the land to water supply below varies from six to ten feet.

These results show a very satisfactory growth, and should afford ample encouragement to those who contemplate forest-tree planting in this county.

TREE CULTURE ON THE PLAINS.

BY W. E. FOSNOT, ELLSWORTH, KANSAS.

It seems useless, almost needless, to give a recital of the trees best suited for culture on the frontier, yet, while experiences differ, and so long as it remains a part of the life-work of any man, the subject is open for thought. Tree culture is a subject worthy of very careful consideration, and while our noble young State is making so many rapid marches toward the front, let us see whether there is not yet room for advancement.

In the first place, our State—the western portion, at least—is comparatively treeless. Congress has wisely provided for the disposal of portions of this to-be great West, by encouraging the growth of timber. Now let the Government go a step further—or, better still, our own State—and offer inducements for the protection of such woods as are of most value to the mechanic and artisan. Should the present method of haphazard tree planting go on as at present, it will take scores, and I may say numerous scores, of years to find within our borders the requisite quantity of such woods as our own mechanics will need for home use in the different branches of manufacturing and repairing.

Stop a moment and ask yourself the question, "When will we be able to take from our own forests such woods as time has told us are the most useful, beneficial, and in greatest demand?" Let our present system continue a few years, and we will stand in a fair way to be branded, "The Cottonwood State of the Union." Can we, as a State, afford it? Some one says, our first efforts must be for fuel. Our efforts should be above this question. Fuel is one of the essentials, but not the only one. The very class of trees, as a rule the most valueless to us in the future—Cottonwood—is being most largely planted, and it is time for the people of our State to stop and consider before we go further, and inquire if the future prosperity of our State does not demand something better at our hands. At present we are allowed a certain number of acres of land as a consideration for planting a given number of acres. What is the object of a large majority of the planters? They are not men of capital; they are not men of large experience in planting and caring for trees; and it is not a business proposition with them further than to secure the land, and when the requisite number of trees are planted they seem to think that is all.

But another question comes in here—Will not the future wealth of our State, the future value of our lands, the future value of places within the State where future mechanics will seek work, and the future growth and prosperity of our cities and towns follow as a result, and be governed largely by what we are to-day planting on our timber claims?

Let encouragement be given to our better class of woods, for the good of our State. We have the raw material—the soil—to work with, and our future greatness among the States largely depends on wise planting at this time. Stimulate in some form the production of the class of woods that will be needed to keep our shops and factories in operation, and we will have no cause for regret. It is a business proposition with us, as a State, and demands attention.

EXPERIENCE WITH FOREST TREES IN ROOKS COUNTY.

BY S. M. STRAYER, STOCKTON.

My experience in Kansas forest-tree culture is limited to the past two years—1879 and 1880; yet in that brief period I am fully convinced that success in agricultural pursuits is dependent largely upon a successful forest-tree culture. Impressed with this fact, I most cheerfully contribute my mite of experience to the general fund of knowledge, hoping that it may be of some value to that class of my fellow-men whose lot may be cast to settle in this country.

For a list of native varieties of forest trees worthy of the planter's consideration, I will name the Cottonwood, Box Elder, Elm, Ash, Black Walnut, Osage Orange and Red Cedar. The Cottonwood should be used only as a nurse tree to the other classes. Hardy Catalpa Speciosa and Osage Orange are worthy of extensive planting. These endure our summer drouth. Red Cedar is the best of all our native trees to break the stinging force of the cold north winds of winter, and is very desirable for belts, planted on the north of the dwelling house, and a shelter to the stable. Its seed seldom germinate until the second year after planted, unless artificially prepared, as follows: Soak them in weak lye, and then rub them with the hands to remove the resinous coating with which nature covers the seed, and in favorable weather they will germinate in a few weeks. Shade lightly the young plant as soon as it appears, with brush or a screen. When two years old, transplant from the seed-bed in June.

Cottonwood and Elm seed ripen in early spring, and require planting at once or to be placed in a moist place, to prevent their drying out. They being quite small, require a light covering. A partial shade, and daily moistening of the soil during a dry spell, will add much to the success of these seeds.

Black Walnuts should be planted in the fall, soon after ripening, and in the place where they are to grow into permanent trees, as they do not transplant safely. They can be carried over until spring by being lightly covered with sod or litter, and then plant as early as practicable.

Ash and Box Elder seed may be mixed with sand in the fall, and thus kept until spring.

Land selected for forest-tree or seed planting should be such as has had two or three years' cultivation, and should be thoroughly plowed twelve to fifteen inches deep, and well pulverized. Thus prepared, it will be sufficiently moist to afford success in planting, whilst a poorly-prepared piece of land would result in failure.

All classes of trees, except Evergreens, should be planted as early in the spring as the ground can be prepared. The best method for planting young, say one-year-old forest trees, that I have practiced, is as follows, viz.: The land being properly prepared, lay it off in rows one way four feet apart, with a common marker; then with a plow cross it with rows twelve feet apart, turning a shallow furrow. Set the trees in the checks, or where the plow crossed the markings first made. This will give rows twelve feet apart, and the trees will stand four feet apart in the row. Pack the soil carefully among the roots, and tramp it down. Then with a plow turn a furrow to the trees on each side. The roots should be kept moist, and protected from sun and air from the time the trees are taken up until they are planted.

Plant wind-breaks on the south of the farm to protect from the hot south winds in summer, and on the north to shut off those from the north. A wind-break, four to six rods wide, on the south side of a farm, is the best investment a Rooks county farmer can make. Every 160-acre farm should have at least forty acres of growing timber.

TREE PLANTING ON THE AGRICULTURAL COLLEGE GROUNDS.

BY PROF. E. A. POPENOE.

(A republication from the Industrialist, by suggestion of the author.)

As a contribution to the general fund of arboricultural knowledge in this State, a summary is here given of the various experiments made by the Horticultural Department with many kinds of trees, on the grounds of this institution.

The first attempts at tree culture that have given results of value, were made at the old college, in the year 1872. During this year, plantations of European Larch, Deciduous Cypress, White, Red and Green Ashes, Osage Orange, Catalpa, Ailantus, Black Walnut, White Hickory, Soft Maple, and Willow, were made. The ground selected for the forest plat was below the average of upland soils, part of it quite dry and gravelly, and all with a southern exposure. The planting of all varieties was in rows four feet apart, laid north and south, the trees standing about one foot apart in the rows. The greater part of the trees grew well, the exceptions being the Red Ash, White Hickory and European Larch. The latter have failed entirely since. In 1873, the number of varieties under trial was increased by plantations of Box Elder, Chestnut, White Elm, Scotch Pine, Red Cedar, Austrian Pine and Norway Spruce.

The results of these plantings so far as developed during the year, show greatly in favor of the Box Elder, White Elm, Red Cedar and Austrian Pine, as well as those that grew in the planting of 1872. Small plantings of different Birches, Beech, Sugar Maple and Chestnut have resulted unfavorably, in the main; although encouragement is given to continue, on a small scale, the two trees last named.

The year 1874, memorable on account of the invasion of the Rocky Mountain locust, was one of disaster to tree planters. In the groves on the college grounds, the Evergreens suffered more than other trees. The Red Cedar, Mountain Pine, Austrian Pine and Pitch Pine proved able to withstand the attacks of these insects, while the Spruces, Scotch Pine, Arbor Vitæ and Junipers were destroyed almost without exception. The deciduous trees were injured in a comparatively slight degree, with the exception of the European Larch and Chestnut, the former being entirely killed, and the latter very seriously injured.

The evidence of this year speaks in favorable terms of the Ailantus, when planted on high, dry land. In such situation, its tendency toward a succulent late growth is checked, and it is enabled thus to withstand ordinary winters; while on low lands, this tree is only partially hardy. On account of its very luxuriant growth, it affords complete protection to the ground after the first year.

A survey of the various tracts planted in forest trees of various kinds, gives very satisfactory evidence of the ability of some varieties to withstand the ordinary vicissitudes of our climate. Considering the poverty of the soil in which they stand, the Black Walnuts, Catalpa, Osage Orange and Cottonwood have made exceptionally fine growth. The wisdom of close planting is here apparent. Trees in these plats, standing about one foot by four apart, have served as a protection to each other—shading the trunks, rendering them less liable to the attacks of boring insects, and retaining the moisture of the soil. The tendency to a low, spreading growth, which is found on less dense plantations, is here corrected; and the trees take instead an upright form, with smooth, straight trunks branching high. This is, of course, a consideration of great importance where trees are grown for timber.

While the general results are essentially as stated, the fact that trees of some of the less hardy varieties are alive and in a state of vigorous growth, hints at the possibility of greater success with these trees, if they can be fairly started. A few Chestnuts are found that have attained a height of fifteen or twenty feet, with corresponding size of trunk. A few White Pines, and an occasional Spruce, have also grown to good size. The same may be said of the Sugar Maple and the Butternut.

FOREST-TREE CULTURE.

BY A. N. GODFREY, MADISON.

Kansas is a prairie State, and her native forests are small, few and far between. The question of planting artificial groves becomes of vital interest to her citizens. It is only within the past few years that we have commenced to realize the importance of this subject. From the number of treeless homes on our broad prairies, it would seem that the benefits derived from planting trees cannot be too strongly urged upon our people. The earlier settlers chose timbered claims, where wood for fuel, and the thousand-and-one necessities of a farm, were close at hand. It is only since the upland began to be settled, and the western counties dotted with prairie homes, that the subject of timber culture has awakened interest.

The energetic prairie farmer, with his fuel and fencing to buy at exorbitant prices, his building material to ship from the Eastern pineries, his only shade and shelter derived from the cockle-bur and sunflower, with nothing to break the force of the winter winds which penetrate to every part of his house, and drive out the last particle of warmth from his home and his heart—he, above all men, can realize the beauty, the comfort and the intrinsic value of a vigorous, healthy, growing tree. His mind dwells with sadness on the wanton waste of timber in the balmy days of log-rollings, as he shivers over the stove—that if kept at a red heat cannot warm the air as fast as it enters up through the floor, down through the ceiling, and in through the closely-battened crevices.

In the East, where Nature seemed so lavish with her sylvan gifts, every step is being taken to preserve the native forests. How much more important, then, becomes the plantation and cultivation of artificial forests on our broad, treeless plains. Western men are too prone to grasp at anything that promises quick returns, while matters of great importance, that require time to develop, are overlooked. Farmers will plant a field to corn year after year, because the crop, though small in value, is returned annually. If the same ground be planted to trees, only a few years—six or eight—would grow poles equal in value to a crop of corn. From this time on, the value increases each year, till the field becomes worth the entire farm besides.

But it is not for the wood alone that trees should be grown. A prairie home needs protection from the fierce, piercing storms of winter and the scorching blasts of summer. This involves the question of comfort to man and beast, the importance of which cannot be overlooked. A farmer in charge of stock has a moral duty to perform in providing for the comfort of his animals, just as important and binding as his family duties. Upon our broad prairies, where the wind sweeps for miles without resistance, no shelter can be constructed which is equal to that afforded by a few trees. So much has already been said on the subject of wind-breaks, and their effects upon air currents, that it becomes unnecessary to enlarge upon the subject here. Former reports of this Society contain well-written essays on the protection given by timber belts to orchard, garden, and growing grain. On the sandy plains of the upper Arkansas, the shelter-belt theory has attained its greatest victory. In that region, "no shelter, no crop," has become an axiom. Unless surrounded by hedges or belts of trees, the land "takes to itself wings" and, in local parlance, "skips." We were informed that the land could not be held even by a mortgage, and that the deeds were made portable, so that a man might follow his drifting farm. Under the influence of narrow belts of growing trees are found vigorous, verdant crops, while outside are scorching drouth and shifting sand.

There is still another benefit derived by planting trees. It makes a home pleasant, enjoyable, beautiful, *home-like*. Was it ever your lot to visit a prairie farm where the owner was always *too busy* to plant trees? Here by the gate, as you enter, is a lonely peach tree, which has encountered many hardships in its struggle for existence. The one remaining branch waves mournfully in the air, sadly suggesting "what might have been." A glance to the right reveals the sheds and stables, standing out in bold relief, proclaiming the owner to be a *stock-man*. For him earth has has no beauty beyond the limits of his stables and sheds. There, just behind the house, is the pig-pen, a board or two across the top as a partial shelter. The house is made of four walls, and covered with a roof, with holes sawed out for windows and doors; no flower, nor shrub, nor clinging vine to relieve the monotony. You hasten to leave the place, with an unsatisfied, aching *void*, that will last for days. You find yourself unconsciously repeating the words of our honored friend, Geo. Y. Johnson: "There be places where people stay, and eat and sleep, that are no more worthy to be called *homes* than a swill-barrel is suitable for a butter-chest."

There is another picture in the writer's mind, in direct contrast to the one just given. You enter the gate, and proceed toward the house by a curved gravel walk, bordered with flowers. Here is a yucca, with its curious floral organs; there a delicate climber; here a rosebud, and there a bed of blooming annuals; here a pine, and there a cedar. A croquet ground is laid out beneath the shade of native oaks, while the whole yard is carpeted with the cool refreshing grass, which woos you to a romp in its cool depths. The house stands in the midst of this loveliness, in full and complete harmony with its surroundings. There is nothing grand and imposing in its architecture, no marble steps or costly statuary to clash with nature's artlessness; simply a solid, comfortable building, with vine-covered porch and flower-lined windows. The outside view foretells the comfort within. Here, by the wide parlor window, is a table covered with books and pictures. The sunlight, flowers and birds of the dining-room lend an enjoyment to the meals that must be felt, to be known. In every feature is written that sweetest and dearest of all English words, *home*. How delightful to come from the hot, dusty, smoky, noisy city, to this haven of rest, where care seems powerless to enter! How sweet to press the snowy pillow, with the cool, fragrant evening breeze entering through the open window, and be lulled to sleep by the katydid's song! The associations of a visit to this pleasant spot will be lasting as memory itself. Is not such a home worth a lifetime of patience and labor? Money cannot buy it, with all its pure enjoyments. It must be *made*, built up year by year, slowly and surely.

May we not assert that all our great men owe their fame to the elevating, chastening influence of trees? Washington spent his early days among the forest-clad hills of the East. Lincoln's character and mind developed while splitting rails in the grand old forests. Ohio, "the mother of Presidents," is a timbered State.

Trees are important from a sanitary point of view. With their leaves drinking in the noxious gases from the air and the roots nourished by the decaying matter of the soil, they become the best of curatives. Our M. D.'s would lessen the traffic in quinine by prescribing large annual doses of fruit and forest trees. The icy, scorching touch of the dread ague is more frequently turned aside by the friendly, sheltering arms of a dooryard tree than by a swill-barrel full of tonic bitters. There is a strengthening influence in their very presence that cures.

When we consider the fuel, shelter, beauty and comfort obtained by a little outlay in planting trees, it becomes a wonder why so many of our Kansas farms are treeless. The writer has seen our native underbrush grow from riding-whips to respectable flag-staffs, and considers himself a young man yet for all that. How short seems the time from "back-sight" over the intervening years!

While it requires time for trees to develop to a goodly size, yet the return for your labor is felt from the moment of planting. You have something to look forward to and hope for in the future; and as the trees increase in size, you find your interest increasing in proportion. He who plants trees once, and cares for them properly, will continue to plant, always finding some new spot to be beautified. Every patent or deed to a piece of land contains an unwritten clause binding the "party of the second part" to enhance the beauty and value of the same by the planting of trees. Plant trees, and thus fulfill a duty to your country, your family, your posterity, and *yourself.*

FOREST-TREE CULTURE.

REPORTED BY COUNTIES.

The following circular was extensively distributed throughout those counties wherein the production of forest trees for fuel, shelters and timber had been made a specialty, and more largely among the experienced men of the western counties, where such culture is a necessity to the welfare of the agricultural and horticultural interests. While there may be a similarity in the recommendations of many of these reports, (which feature affords evidence of a unanimity, and to a certain extent a confirmation of methods adopted in the management of forest trees,) there are variances which give evidence of either a material difference in the results of the location, soil or management, or that the experiments have not been sufficiently extended to determine a uniform result. While it is a question of doubt, in the minds of some, whether any system of culture can be made general in application even to all parts of the same county, yet it is to be hoped that the successes in some portions may afford sufficient relief to some of the causes of failure in others; and to secure such an end has been the aim of this Society in sending out this circular. The determination of a successful forest-tree culture is of vital importance, and more directly concerns the interest of settlers upon the western portion of the State, and with that class will rest largely the solution of the problem: "What shall be the culture of forest trees most successful to meet their wants?"—Sec'y.

[Circular No. 2, 1881.]

Secretary's Office, Kansas State Horticultural Society,
Lawrence, Kas., January 20, 1881.

My Dear Sir: This circular is offered to you for the purpose of obtaining information upon the question of *Forest-Tree Growing*, for timber and shelter—answers to which will be made a part of a manual on Forestry, designed especially to meet the wants of settlers located in the western counties of Kansas. You are kindly urged to give this matter your careful and earnest attention, that a reliable system of forest-tree culture may be disseminated in sections where a success in such work is of the first importance in making a settlement.

QUESTIONS.

1st. Have any classes of forest trees been successfully planted and grown in your county? If so, please give a list of such in the order of—first, their success; second, their value for timber; third, their value for shelter-belts.

2d. What varieties are preferable for lowlands?

3d. What varieties are adapted to uplands?

4th. What preparation of the land is required?

5th. What classes are easily propagated by cuttings?

6th. What classes require propagation by seeds?

7th. What preparation of seeds and cuttings is required before planting, and at what time should they be prepared? (Please state the preparation of each variety clearly, and in full.)

8th. Please state clearly the time and manner of planting seeds and cuttings in the nursery, and in rows, where they are to form groves and belts?

9th. What distance should trees be planted in forming timber lots?

10th. What should be the culture the first year in the nursery?

11th. What, when planted for timber lots, groves and shelter-belts?

12th. What the culture each year thereafter?

13th. At what age (varieties named) is it safe to cease cultivating?

14th. Do field and garden crops thrive better where protected by timber-belts than where not so protected?

15th. Have you evidence that timber growing can be made a profitable investment?

16th. What is the age of the oldest successfully-grown timber lot, grove, or belt?

17th. What variety of trees are they?

18th. Is it on upland or lowland?

19th. What is the average diameter and height of the trees in the plantation?

ALLEN COUNTY.—BY H. E. VAN DEMAN, GENEVA.

The following varieties of forest trees have been successfully planted and grown in this county: Black Walnut, Catalpa, Honey Locust, Osage Orange, White Ash, Sycamore, Elm, Cottonwood, Soft Maple, and are named in the order of their success. Those valuable for timber are the Catalpa, Black Walnut, Osage Orange, White Ash, Honey Locust, Elm, Soft Maple, and Cottonwood; for shelter-belts, Soft Maple, Cottonwood, Elm, Honey Locust.

The Catalpa, Osage Orange, Black Walnut, Elm, Cottonwood and Soft Maple adapt themselves to either upland or lowlands.

The preparation of the ground before planting should be thorough in the fall.

The following classes are easily propagated from cuttings: Cottonwood, Catalpa, Willow. All cuttings should be made in the early part of winter, and from the season's growth, and either buried in the ground, or packed away in some moist place.

Seeds—their treatment: All nut seeds should not be allowed to dry. Plant these in the fall, or pack in damp earth or sawdust until spring. Soft Maple and Elm seeds should be planted as soon as they drop, which occurs in early summer. Seeds of Box Elder, Ash, Sycamore, Honey Locust and Catalpa should be kept dry until spring. Nuts should be planted in the fall, where they are to grow into trees. The seeds of Catalpa, Box Elder, Sycamore, Ash, Soft Maple and Elm can be grown in nursery for one or two years. Plant in drills, and cover about one inch deep. Honey Locust seed should be soaked in scalding-hot water before planted, to soften the shell.

In forming timber lots, trees should be planted four feet apart each way, and in rows; thin out as the after-years' growth requires; keep the weeds down and the ground loose with cultivator and hoe, until the trees shade the ground.

Field and garden crops are materially benefited by shelters constructed with forest trees.

We have satisfactory evidence of the profitableness of timber growing in this county.

The age of the oldest successfully-grown timber lot is now twenty years, and is composed of Cottonwood, planted on upland. The average diameter of these is eighteen inches, and the height forty feet.

BY C. C. KELSEY, HUMBOLDT.

Forest trees have been successfully planted and grown in this county. The following have afforded the most satisfactory results: Black Walnut, Ash, Hardy Catalpa, Elm, Soft Maple, and Box Elder. Those valuable for timber are the Black Walnut, Blue Ash, and Hardy Catalpa; for shelter-belts, Soft Maple, Lombardy Poplar, and Cottonwoods are preferable.

Varieties adapted to lowlands, Soft Maple, White Willow, and Cottonwood; to uplands, Elm, Box Elder, Oak, Ash, and Lombardy Poplar.

The preparation of soil should before planting be the same as for corn.

Propagation by cuttings: Lombardy Poplar, Cottonwood and White Willow are easily grown from cuttings, which should be made late in the fall, and buried below frost until planting-time in spring.

Preparation of seeds: Black Walnuts should be gathered in the fall, and bedded in the ground where there is no danger of water standing; cover lightly with earth. Treat the seeds of Oak in the same way. Box Elder and Ash seed, gather in the fall and pack in boxes, mixed with soil, sand or sawdust, and bury the boxes slightly in dry earth. Plant all nut seeds as early in the spring as the ground can be prepared. Catalpa seed should not be planted until the ground warms up in spring. Ash and Box Elder can be planted earlier, cover them about one inch deep. Soft Maple and Elm should be planted as soon as they ripen in spring, which is generally in May and June—Maples from one to one-and-a-half inches deep; cover Elms lightly.

Distances to plant for timber lots: Set in rows five feet apart and three to five feet in the rows, and thin out in after years as the growth requires, or plant in rows ten feet apart, and cultivate the space between with a crop of corn.

Cultivate in nursery the same as for corn, with at least one good hoeing. Take the young trees up in the fall and carefully pack in trenches, and replant the following spring. The culture after being planted in timber lots should be shallow plowing or constant mulching until the trees afford a shade to the land, which, with the Soft Maple, Cottonwood, Willow and Lombardy Poplar, generally occurs at the end of three years; Black Walnut, Oak, Pecan, Ash and Catalpa in five years.

The benefits to field and garden crops from timber protection on the north and south sides are especially noticeable.

Investments in timber growing are profitable.

The oldest groves planted in this county are now ten years old; were composed mostly of Soft Maple, Cottonwood, and Black Walnut, and planted on upland. Their average diameter at this time is five inches, and height twenty feet.

ATCHISON COUNTY.—BY THOS. F. COOK, MONROVIA.

The following classes of forest trees have been successfully planted and grown in this county, and are named in the order of success: Soft Maple, Cottonwood, Black Walnut, and Lombardy Poplar. Those valuable for timber are Black Walnut, Soft Maple and Cottonwood; for shelter-belts, Soft Maple, Cottonwood, and Black Walnut; and for an Evergreen, Scotch Pine.

Preferable for lowlands are the Soft Maple, White Willow, and Cottonwood; adapted to uplands, Soft Maple, Cottonwood, Black Walnut, Lombardy Poplar, and Scotch Pine.

The soil, before planted, should be prepared as for corn.

Propagation: Those easily grown from cuttings are Lombardy Poplar and White Willow; by seeds, most all classes of forest trees. The nut-bearing species should be planted in the fall; all other classes except the Soft Maple and Elms should be gathered in autumn, when ripe, and stored until spring. The Soft Maple and Elms should be planted as soon as ripe, in late spring. Cuttings may be made any time during winter, when the wood is not frozen, and kept in a damp place until spring; then plant as soon as the ground can be put in a condition suitable for a corn crop.

Distance to plant for timber lots: Plant in rows four feet apart each way, and as the trees enlarge thin out. Cultivation should be kept up until the middle of July, with plow and hoe, until the trees are large enough to shade the ground.

Cannot perceive any beneficial effects to field and garden crops from the protection of timber belts, only so far as they influence rainfalls. Investments in timber growing can undoubtedly be made profitable with the settlers in the western part of the State.

The oldest successfully-grown timber lot in this county is twenty-two years; was constructed of Cottonwood, and planted on upland.

BARBOUR COUNTY.—BY J. E. CHAPIN, MEDICINE LODGE.

As yet but little attention has been given to tree planting in this county, owing to the fact that the original groves furnish a sufficient supply of timber for fuel. The only planting has been in small groves or in door-yards, for shelter and shade. Cottonwood is generally used for such purposes.

BARTON COUNTY—BY JOSEPH GAULT, GREAT BEND.

The following classes of forest trees have been successfully planted and grown in this county, and are given in the order of their success: Black Walnut, Cottonwood, Box Elder, Gray or White Willow. Valuable for shelter-belts—any of the foregoing are suitable; the Black Walnut is most desirable for uplands, and Cottonwood and Box Elder for lowlands.

The preparation of land before planted should be as thorough as is required for a corn crop.

The following classes propagate easily from cuttings: Cottonwood and Willow, which should be taken from the trees at the time the buds begin to swell, and planted immediately, avoiding as much as possible any exposure to wind or sun. Select cuttings from last year's growth.

Seeds: Black Walnuts should be bedded in the fall in moist soil, and covered lightly, that they may freeze during winter. Box Elder and Ash seed should be packed in moist sand through the winter. Plant all cuttings early in spring; fall-ripening seeds about the time for planting corn.

Distance to plant for timber lots, in rows, four feet apart each way; cultivate thoroughly until the trees shade the ground; plant no crops among them which will exhaust the moisture of the land, and afford the young trees every advantage to sustain a vigorous growth.

Field and garden crops thrive better when protected by timber belts than those in exposed places.

I am satisfied that where the same care is bestowed in planting and cultivating forest trees as is necessary to produce successfully other kinds of crops, they will succeed.

There are no successfully-grown timber lots in this county that are over four or five years old. These were planted on both upland and bottom, and are composed of Cottonwood and Box Elder, and will measure in diameter from two to four inches, according to the care that has been given them.

BUTLER COUNTY.—BY W. H. LITSON, BENTON.

The following classes of forest trees have been successfully planted and grown in this county, and are named in the order of success: Cottonwood, Lombardy Poplar, Osage Orange, Black Walnut, Box Elder, Red Cedar, Ash, Elm, and Willow. Those valuable for timber are the Black Walnut, Osage Orange, Ash, Cottonwood; for shelter-belts, Cottonwood and Osage Orange.

All of the foregoing classes do well on both upland and lowland.

The preparation of the land before planted should be in manner similar to that required to produce a good crop of corn.

Propagation: The Cottonwood, Willow and Poplar are easily grown from cuttings, and should be made in the fall, about ten inches long, and of the current year's growth; tie in small bundles and bury in the ground below any danger of freezing, or cut in spring and plant as soon as the land can be prepared. The Box Elder, Walnut, Osage Orange, Cedar, Ash and Elm must be grown from seed. The seed of the Ash and Walnut should be kept moist during winter by packing in damp sand or soil. Gather Box Elder seed in autumn, and keep dry until spring. Place Osage Orange in sacks, and soak in running water ten days, or place in a barrel of water, changing the water every two days for fresh. Plant Elm seed as soon as ripe, which occurs in this latitude the latter part of spring. All classes held over winter until spring should be planted as early as the land can be prepared. Lay off the land with a corn-ground marker, drop the seed from twelve to fifteen inches apart. Cuttings should be planted in a slanting position, and about the same distance apart as recommended for seeds. Keep the ground mellow and all weeds subdued by cultivation. Close planting affords a natural protection, which is desirable. Cultivation should continue each year until the trees shade the ground.

Field and garden crops thrive better when protected by timber-belts on the south side.

The oldest successfully-grown timber lot in this county has been planted five years, and covers thirty-nine acres, on upland, and is composed of Cottonwood, Box Elder, and Walnut. The average diameter of the trees in this plantation is five inches, and height, twenty-five to thirty feet.

CHAUTAUQUA COUNTY.—BY REV. Z. B. HITCHCOCK, CEDARVALE.

There have been successfully planted and grown in this county the following classes of forest trees, which are named in the order of their success: Cottonwood, Walnut, Lombardy Poplar, Box Elder, Soft Maple, and White Ash. Those valuable for timber, Walnut; for shelter-belts, Cottonwood.

Preferable for lowlands, Walnut, White Ash, and Box Elder; for uplands, Cottonwood, Box Elder, White Ash, Sycamore, and Lombardy Poplar.

Land intended for forest trees should be thoroughly plowed and pulverized.

The varieties easily propagated by cuttings are Cottonwood and Lombardy Poplar; by seed, Soft Maple, White Ash, and Box Elder. Black Walnuts may be planted in the fall, or stored in a moist place, to prevent their drying, and then plant in the spring. All classes require good cultivation until four or five years old, and will then take care of themselves.

Field and garden crops thrive better when protected by timber-belts.

The oldest successfully-grown timber lot in the county is now five years of age; was planted on upland, and composed of Cottonwood and Lombardy Poplar.

BY M. B. CHRISMAN, FULDA.

The following classes of forest trees have been successfully planted and grown in this county, and are named in their order of success: Cottonwood, Soft Maple, Black Walnut, Elm, Box Elder, are all valuable for timber and shelter-belts, and succeed on lowlands. The Lombardy Poplar and Osage Orange are preferable for uplands.

Land designed for timber lots should be thoroughly cultivated by deep plowing and harrowing, until its wild nature is subdued.

The following classes are easily propagated by cuttings: Cottonwood, Lombardy Poplar, and to some extent the Soft Maple; by seed, Walnut, Maple, Osage Orange, and Box Elder. Walnuts should be lightly covered in the ground in the fall, that they may freeze in winter, and planted early in spring where they are to grow into trees. Box Elder seed ripens in autumn, and should be gathered then, safely stored until spring, and planted. Soft Maple seed ripen in the month of May, and must be planted as soon as they drop from the tree. All cuttings must be planted in spring-time; carefully press the earth down around them.

In forming timber lots, set the trees in rows one rod apart, cultivate light with plow and hoe. Timber lots should be well cultivated until four or five years old; after that they will need no cultivation.

Field and garden crops are benefited by the protection afforded by timber-belts.

Where natural forests are not abundant, timber growing can be made profitable.

The age of the oldest successfully-grown timber lot is from six to seven years; was planted on upland, of Cottonwood, Walnuts, and Soft Maple. The average diameter of the trees is six to eight inches, and height, twenty to thirty feet.

CHEROKEE COUNTY.—By Thos. W. Smith, Baxter Springs.

The Black Walnut, Cottonwood, Maple, Lombardy Poplar and Pecan trees have been successfully planted and grown in this county, and succeed in the order named. Those most valuable for timber are Black Walnut and Pecan; are equally valuable for shelter-belts, and succeed on both uplands and lowlands.

The land should be thoroughly prepared before planted.

Propagation by cuttings: Cottonwood, Lombardy Poplar, Willow and Silver-Leaf Poplar are all easily grown from cuttings. These should be made in the fall, and of the current year's wood; bury in the ground through winter, and plant early in the spring; set in well-prepared ground, leaving only one bud above.

Seeds: Nuts should be planted in the fall, in moist land, where they will freeze.

For timber lots set the trees in rows five feet apart, and ten inches apart in the rows, and as their growth interferes, thin them. Cultivation, the same as is required for corn until the trees are large enough to protect each other.

Field and garden crops are very much benefited by the protection of timber-belts.

The oldest timber lots successfully grown in this county were planted in 1869, on the prairie, and the average diameter of the trees at this time is eight inches. The Maple, Black Walnut, Cottonwood, Lombardy Poplar, Locust, Pecan and Hickory were used.

CRAWFORD COUNTY.—By Thos. Ping, Girard.

The Cottonwood, Maple, Walnut, Catalpa, Box Elder and Sugar Maple have been successfully planted and grown in this county; are successful in the order named. Walnut and Catalpa are the most valuable for timber, and Cottonwood, Maple and Box Elder for shelter-belts.

Walnut, Cottonwood, Hackberry and Hard Maple are preferable for planting on lowlands. The Walnut, Cottonwood, Maple, Catalpa and Box Elder are better adapted to uplands.

The land should be thoroughly plowed and harrowed before planted.

The following classes are easily propagated by cuttings: Cottonwood, Lombardy Poplar, and Balm of Gilead, which should be made about eight inches long. Black Walnut, Catalpa and Box Elder propagate from seed, which should be gathered in the fall. Black Walnuts should be planted in December, the others in spring. Soft Maple, and Hard or Sugar Maple seed ripen in May, and must be planted at once. All cuttings require planting in spring. Leave only a couple of inches above ground. All seeds except the Walnut do much better planted in nursery form until one year old, and then transplant.

For timber lots, plant trees in rows four to six feet apart, and two feet in the row, and thin out as they enlarge so as to interfere. Clean culture should be given until trees are from four to six years old.

Do not see any benefits to field and garden crops from the protection of timber-belts.

There is sufficient evidence that timber growing can be made a profitable investment in this county.

The oldest successfully-grown timber lots in this county are now ten years, and were planted on upland prairie; are composed of Walnut, Soft Maple, Catalpa, Cottonwood, Lombardy Poplar, Box Elder, Ash, Elm, Hickory, Hackberry, Mulberry, and Balm of Gilead. The average diameter of the Cottonwood is twelve inches, and height forty feet; Box Elder, eight inches, and height twenty feet; Walnut, six inches, and height thirty feet.

CLOUD COUNTY.—By C. H. Sheffield, Glasco.

The following list of forest trees have been successfully planted and grown in this county: First, as to success, the Cottonwood and Box Elder are preferable; second, valuable for timber, Catalpa, Black Walnut, Ash, Elm; third, for shelter-belts, Cottonwood, Box Elder, and Ash. The last three named are best adapted for lowlands; and for uplands, the Catalpa, Black Walnut, and Ash.

The preparation of land before planting should be the same as for a crop of corn.

Propagation: The Cottonwood and Catalpa are easily grown from cuttings. Those of the Cottonwood should be made in the fall, and stored in a cool, moist place until time to plant in spring, or cut from the tree in spring, and plant at once. Catalpa is easier to propagate than Cottonwood. The cuttings should be taken from the tree in spring-time, and planted soon after.

Seeds: Plant those of the Catalpa in well-prepared seed beds in the spring, as soon as the ground can be prepared. Those of Ash, Box Elder and Walnut, plant in autumn. Trees propagated from seed should be planted in nursery form, and there grown until one year old. Distance to plant in timber lots: Four feet each way is most conducive to straight and well-formed trees. Give thorough culture for the first four years thereafter, to insure a vigorous growth.

Field crops and garden truck thrive much better where protected by timber-belts than when not.

There is an abundance of evidence that timber growing can be made profitable.

The oldest timber lots in this county are now twelve years of age; were planted mostly with Cottonwood, Box Elder, Walnut, Ash and Elm, and largely on upland. The average diameter of the trees at this time is ten inches, and the height fifteen feet.

COWLEY COUNTY.—BY REV. J. CAIRNS, WINFIELD.

The Cottonwood, Black Walnut, Catalpa, Box Elder and Soft Maple trees have been successfully planted and grown in this county, and are named in the order of their success: Varieties valuable for timber are Catalpa and Black Walnut; for shelter-belts, Box Elder and Soft Maple.

All the foregoing varieties are adapted to upland and lowland planting.

The land should be thoroughly cultivated before planted, as trees will not succeed on any land until its wild nature is fully subdued.

Propagation: All the Poplar family and the Catalpa succeed from cuttings, which should be made in the fall before any severe freezing weather, and buried in the ground until spring; then plant about the time the buds begin to swell. Seeds of Walnuts should be planted in the fall, but may be in the spring, with the hulls on. Seeds of the Box Elder and Catalpa should be gathered in the fall and planted in the spring. Soft Maple seed ripens late in the spring, and must be planted at once, to make a success.

For timber lots, plant in rows four feet apart, and one way mix with some of the Willow or Poplar family, with the purpose of cutting them out when the growth becomes crowding. Cultivate thoroughly the same as required for corn until three to five years old, according to variety.

Field and garden crops are very much benefited by timber-belt protections.

Growing of timber can be made a profitable investment in this county.

The age of the oldest successfully-grown timber lots are now from seven to nine years; are composed mostly of Cottonwood; some few are Black Walnut, and were planted on both upland and lowland. The diameter of these trees ranges from nine to twelve inches, and a height of fifty feet.

DAVIS COUNTY.—BY PROF. E. GALE, WAY.

The following classes of forest trees have been successfully planted and grown in this county, and are named in the order of their success: Cottonwood, Black Walnut, Box Elder, Willow, and Soft Maple. Those valuable for timber, Black Walnut; for shelter-belts, Osage Orange, Box Elder, and Cottonwood.

Varieties preferable for lowlands: Willow, Black Walnut, Box Elder, Cottonwood, Maple, Mulberry, and the deciduous Cypress; evergreen, Red Cedar; adapted to uplands, Red and White Elm, Box Elder, Maple, Cottonwood, deciduous Cypress, and Red Cedar.

Land intended for forest tree plantations should be thoroughly broken up, and receive one or two years' cultivation before planted.

Varieties easily propagated by cuttings are Cottonwood and Willow; by seed, Maples, Elms, and Mulberries. Cuttings should be made in late fall, or in mild weather in winter, when the wood is not frozen; tie in bundles, and bury ten or twelve inches deep, in a moist soil, where they will callous and become ready for early spring planting. Nuts, like Black Walnuts, Oaks, etc., should be planted in autumn, where they are to form into trees, or kept in a moist place until spring, and then planted. Some of this class only require moisture for their germination; such are the Oaks and Chestnuts. Others are more sure to germinate if exposed to frost. The Osage Orange and Mulberry seed can be kept dry until spring, and then planted.

In forming timber lots, set in rows four feet apart and one foot in the row, for nearly all kinds of trees. Cultivation should be the same as required for corn, each year, until the trees are three or four years planted.

That field and garden crops are benefited by the protection of timber-belts, I think, is generally conceded by all careful observers.

The oldest successfully-planted and grown timber lots in this county are now eighteen years. Most of them were planted on upland, and composed of Cottonwood, Black Walnut, Maple, Ash, Oak, Willow, Box Elder, and Red Cedar.

BY NEWELL TRAFTON, MILFORD.

Of the classes of forest trees, the Black Walnut, Soft Maple, Cottonwood and Box Elder have been successfully planted and grown in this county, and are preferred in the order named. The Black Walnut and Cottonwood are most valuable for timber; and these, with the Box Elder, are the best for shelter-belts.

For planting on lowlands, the Black Walnut, Cottonwood, Maple, Red and White Elm succeed the best; on uplands, Black Walnut, Cottonwood, Soft Maple, Box Elder.

Land, before planted with forest trees, should be plowed deep, and thoroughly pulverized.

The Cottonwood propagates easily by cuttings; Black Walnut, Box Elder and Maple require to be propagated from seeds; for Black Walnuts, open a furrow four to five inches deep with a plow, and drop a nut therein once in every four or five feet, and cover them with a plow; they should be planted in fall as soon as ripened. Soft Maple seed ripens early in May, and must be gathered at once, and planted in shallow furrows four to five feet apart, dropping the seed five to six inches apart, and cover from one to one and one half inches deep with fine soil. Treat Box Elder seed same as Soft Maple at time of ripening, which occurs in September or fore part of October. Cottonwood cuttings may be made early in spring about one foot long, and planted in a furrow five to six inches deep, at an angle of forty-five degrees; with a plow turn a furrow on to them, leaving about four inches above ground.

In forming a timber lot, set trees in rows, six feet apart, and thin out when grown to be too close. The cultivation of trees in a timber lot should be thorough and constant, to subdue all weeds and keep the ground mellow, until such times as the trees shade the land.

There is no question but that timber belts afford a congenial protection when properly arranged, and are very desirable.

Timber growing can be made profitable in this county.

The age of the oldest successfully-grown timber grove in this county is now fourteen years; was planted on high, rolling prairie, and composed of Cottonwood and Black Walnut. These are now twenty feet high and five inches in diameter at the base.

DICKINSON COUNTY—By John W. Robson, Cheever.

The Ash-leafed Maple (Box Elder), White and Red Elm, Black Walnut, Green Ash, Hackberry, and Cottonwood have been successfully planted and grown in this county, and are here named in the order of their success. All are valuable for timber except Cottonwood, and that for immediate use on the farm for fuel and building temporary sheds. For shelter-belts, any of the foregoing classes are suitable.

The White Elm, Walnut, Hackberry, Honey Locust, Soft Maple and Cottonwood are preferable to plant on lowlands, and the Ash-leafed Maple, Red Elm, Black Walnut, Green Ash, Hackberry and Honey Locust are adapted to upland.

The preparation of ground for forest trees should be by deep plowing and thorough harrowing. If the subsoil is well stirred, the finer will be the growth.

The classes of trees easily propagated by cuttings, are Cottonwood, Lombardy Poplar, White Willow, Ash-leafed Maple; the classes to be propagated by seed, Ash-leafed Maple, Ash, Soft Maple, Elm, Walnut, Sycamore, Honey Locust, and Hackberry.

Preparation of seed and cuttings: Ash-leafed Maple seed should be sown in the grove form, in shallow drills as soon as gathered, or stored in boxes and placed on the north side of a building. Seeds that have been dried must be soaked in cold water twenty-four hours before planted in the spring. These directions apply equally to seed of Ash, Sycamore and Hackberry. Walnuts should be buried over winter. Honey Locust, keep in the seed-pods over winter; in April shell them from the pods and cover them with boiling water, and allow them to soak for twenty-four hours. Sow in drills, and cover two inches deep. Cuttings: These should be made in November, tied in small bundles and packed in a pit with the tops down; cover them with one foot of soil. Soft Maple seeds ripen in May, and should be sown at once. Elm seed ripen in April, and should be sown immediately and covered lightly. The surface of the ground should be kept moist until the plants come up.

The grove and shelter-belt should be the farmer's nursery; all the propagating should take place here, both by seeds and cuttings. He needs no other. We hold that timber trees should be sown and planted; those grown from cuttings, where they are to form permanent trees, to be successful, the tap-root must be preserved. For seeds, make drills with a corn-marker, drop three or four seeds in a place, four feet apart in the row and cover about one inch deep. This applies to Ash-leafed Maple, Ash, Elm, Soft Maple and Hackberry. Walnuts—drop one in a place, four feet apart, with the shuck on them, and press the ground down firmly.

In forming timber lots, set the trees four feet apart each way. Cultivation should be of the best, while the plants are small, with the cultivator, and when needed to clean out the weeds, use a hoe. Keep it up each year until they are so large as to prevent such work among them.

It needs no argument to prove that field and garden crops require the protection of shelter-belts.

The oldest successfully-grown timber grove in this county is now nine years of age; was planted on upland, and composed of Walnut, Elm, Ash, Ash-leafed Maple, Soft Maple and Cottonwood.

Failures: The Lombardy Poplar, White Willow, Black Locust, Yellow Locust, Ailantus, Catalpa (common), are condemned varieties.

Evergreens: The Red Cedar and Black Austrian Pine succeed.

The average diameter of Soft Maple, is 7 inches, height 25 feet; Elm, diameter 6 inches, height 20 feet; Lombardy Poplar, diameter 7 inches, height 35 feet; Black Locust, diameter 5 inches, height 25 feet; Ash, diameter 3½ inches, height 12 feet; Honey Locust, diameter 3½ inches, height 15 feet; Ash-leafed Maple, diameter 5 inches, height 15 feet; Walnut, diameter 6 inches, height 25 feet. Evergreens were 1 foot high when planted in 1873, and now measure as follows: Black Austrian Pine, diameter 3½ inches, height 10 feet; Red Cedar, diameter 2½ inches, height 8 feet.

If it be profitable to have plenty of poles for fences and straw sheds, plenty of fuel, and protection for crops, homes and stock-yards, then there is sufficient evidence of the profitableness of forest-tree planting.

EDWARDS COUNTY.—BY GEORGE BELL, KINSLEY.

Of forest trees, the Cottonwood, Box Elder and Black Walnut have been successfully planted and grown in this county, and are named in the order of success. Black Walnut is most valuable for timber, and the Honey Locust and Osage Orange for shelter-belts.

The Cottonwood and Box Elder give the best results on lowlands, and the Honey Locust and Walnut on uplands. Box Elder and Cottonwood are the most vigorous growers.

Land designed for timber lots requires the following treatment: If upland sod, turn it under in June or July; cultivate to wheat or corn one year; then turn the stubble under, and plant to trees in April or May.

Cottonwood and Willow are easily propagated by cuttings, which should be made from young wood in February and fore part of March, and kept moist and cool until the ground can be made ready for planting. With a corn-ground marker, check the ground in squares so that a cultivator or plow can be run safely each way. Set a cutting in each check, with a spade. One man and boy can plant from 3,000 to 5,000 in a day.

Seeds: Prepare the ground the same as for cuttings; drop the seeds in proper place, and cover with a hoe. Walnuts and hard-shelled seeds require freezing during the winter, to crack the shell before they are planted. Box Elder, Ash, and all soft-shelled classes, must be stored in a dry, cool place through winter. Such as ripen in spring or early summer, as the Soft Maple and Elms, require planting as soon as ripened. The culture during growing season should be thorough, keeping the ground level, and should be kept up each year, until the growth prevents.

In forming timber lots, plant in rows, eight to twelve feet each way.

Field and garden crops thrive much better where protected by timber belts.

The oldest successfully-grown timber lots in this county are now six to seven years planted. The greater portion are from four to five years, and are planted both on upland and bottom land. The varieties used were mostly Cottonwood, Box Elder, and Black Walnut, and some Ailantus. The latter is liable to winter-kill.

ELLIS COUNTY.—By Martin Allen, Hays City.

Of the varieties of forest trees which have been planted in this county, the following may be relied upon as the most successful, and in the order named: Cottonwood, Box Elder, Honey Locust, Osage Orange, Elm, Black Walnut, Wild Cherry, and Ash. Varieties valuable for timber, Osage Orange, Ash, Red Elm, Black Walnut, Honey Locust, Wild Cherry, and Cottonwood; for shelter-belts, Cottonwood, Box Elder, and Osage Orange.

All the foregoing are adapted to upland and lowland, and I can see but very slight, if any, difference.

The preparation of land for forest trees should be by thorough and repeated plowing and clean culture. The elements that often make a large growth of weeds should by proper culture be turned into the channels of wood growth of trees.

The following varieties are propagated easily by cuttings: Cottonwood, Lombardy and Silver-leaf Poplar; by seed, Osage Orange, Honey Locust, Elms, Ash, Box Elder, and Black Walnut.

Preparation of seeds: Osage Orange may be put into a sack, and soaked in running water for four or five weeks; drain out the water, and expose in a warm room for a day or two; they will begin to sprout, and should be planted at once. Pains should be taken to secure fresh seed, as that one year old will fail largely. Honey Locust must be scalded before planting. Ash and Box Elder seed may be planted late in fall or early spring, and do not require any preparation. Elm must be planted as soon as ripe, covering very lightly, or sown on the surface, and shaded and watered each day until well started.

It will generally be best to plant seeds in nursery form, and transplant to permanent grounds at one year old. Cuttings and nuts should be planted where they are to form trees — cuttings in the spring and nuts in the fall, and not deeply covered. These seeds can be bedded in the fall, covered lightly until spring, and then planted. In transplanting, keep the roots moist until set, as the roots of young trees injure readily by exposure to sun and wind. To protect the roots, dip them in a thin mud when taken up for setting.

In forming a timber lot, plant in rows, twelve feet apart by three feet in the row. This will allow of cultivation each way. If desired to cultivate only one way, one foot apart in the row is sufficient distance. Culture the first year in the nursery: keep clear of all weeds with a cultivator and hoe, and, if necessary, hand-pull weeds from the rows.

For timber lots, keep up cultivation each year, as long as the trees do not hinder, but never late in the season. Mulching after cultivation is abandoned is advisable.

On the Western plains, all kinds of crops thrive better when protected by belts of timber, and especially so when located on the south side.

Timber growing is a matter of necessity in this county, and if it can be successfully grown, is certainly a profitable investment.

The age of the oldest successfully-grown grove near the ninety-ninth parallel of meridian, west longitude (was planted in 1876), is now five years; was set on fair to good quality of upland, and composed of Cottonwood, Box Elder, and Green Ash. The diameter of the Cottonwood ranges from two to five inches, and is ten to twenty feet in height; Box Elder, one and one-half to three inches in diameter, and six to ten feet in height. The Ash suffered repeated defoliation by the "hateful locust," and were eaten off by a large green worm, and are therefore much less in size.

BY F. J. SWEHLA, WILSON.

The following classes of forest trees have been successfully planted and grown in this locality, and are listed in the order of their success: Cottonwood, Black Walnut, Box Elder, Ailantus, Honey Locust, Catalpa, Elm, Soft Maple, Ash, and Osage Orange. Those valuable for timber are Ash, Black Walnut, Catalpa, Honey Locust, Red Elm, Ailantus, Soft Maple, Cottonwood and Box Elder; for shelter-belts, Box Elder, Locust, Elms, Cottonwood, Catalpa and Osage Orange. (Note: The Peach tree is valuable for such purposes.)

Varieties preferable for lowland planting: Maple, Cottonwood, Box Elder, Willows, Elms, Honey Locust, Ash and Walnut; for uplands, Bur Oak, Walnut, Ailantus, Ash, Catalpa, Honey Locust, Elms, Box Elder, Cottonwood, Soft Maple and Osage Orange.

Land selected for forest trees: If prairie, broken up in May, plowed very deep, at least eight inches in late fall, harrowed thoroughly the following spring. Mark it off with a plow, and plant the trees in the furrow. If seeds are used, cover them shallow. The Cottonwood, Willow, Osage Orange and Honey Locust are easily propagated by cuttings. Most of the following require propagation by seed: Walnut, Oak, Ash, Ailantus, Soft Maple, Box Elder, Catalpa, Elm and Osage Orange. Gather the seeds of Elms, Cottonwood and Maple at time of ripening, in spring, and sow in nursery rows at once. The nut-bearing classes had better be planted in fall. Seed of the Ash, Box Elder and Locust, gather as soon as ripe in the fall, and sow soon after if the ground is ready, otherwise mix them with sand, in boxes or barrels, dampen throughout, place in a cool place, and keep moist until spring. Seeds that are kept over should be sown as soon in the spring as the ground becomes warm. Sow in drills four feet apart, dropping them thick — ten or twelve seeds to a foot.

In forming timber lots, plant in rows four feet apart each way. It is often more convenient to plant in rows eight feet apart and two feet in the rows. This would afford room to pass between the rows with a wagon to haul out such as will need to be cut down in after years, when the thinning-out process begins.

Cultivation: In nursery, hand-hoe the rows when weedy, and cultivate between rows with a horse cultivator; in timber lots or groves, corn may be grown between the rows the first two or three years. The culture it requires is such as is proper for the trees. Clean culture is essential each year, but never later in the season than the first of July. As the trees become large, cultivation should be shallow, to avoid tearing and bruising the roots. Mulching is preferable to any cultivation, where it can be made practicable.

Timber shelters would be injurious to field and garden crops in some countries, but hardly so in Kansas. Crops need light and air, but we are having a superabundance of both in western Kansas.

Timber culture, under the act of Congress, can be made profitable.

The age of the oldest successfully-grown timber lot or grove in this county, dates its planting back to the spring of 1875. This is in the experimental grounds of the Kansas Pacific Railway Company, planted on upland, and composed of Honey Locust, Soft Maple, Walnut, Ailantus, Catalpa, Box Elder and Osage Orange. The present measurement of trees on my place is, Walnut, 5 years old, diameter 1½ inches, height 5 feet; Cottonwood, 3 years planted, diameter 2½ inches, height 15 feet; Peach, 3 years old, diameter 2 inches, height 5 feet.

BY W. E. FOSNOT, ELLSWORTH.

The following classes of forest trees have been successfully planted and grown in this county, and are named in their order of success: Walnut, Cottonwood, Box Elder, Ash, and Catalpa. Those valuable for timber, Walnut, Catalpa, Ash, Box Elder; for shelter-belts, Cottonwood, Box Elder, and Lombardy Poplar.

All the foregoing classes succeed on uplands.

For forest trees, the land should be well prepared before planted.

Those classes easily propagated by cuttings are the Box Elder, Cottonwood, Willow, and Lombardy Poplar; by seeds, Black Walnut, Box Elder, and Ash. Cuttings can be taken from trees, either in fall after the leaves have dropped, or in spring at the time buds begin to swell.

Seeds of Ash and Box Elder are most successful when planted in the fall, soon after frost has occurred. Black Walnuts plant in the fall as soon as ripened, with the hull on, or cover with moist earth or sand during winter, exposed to freezing, and plant in early spring before the sprout appears. Prefer planting Black Walnut, Box Elder, and Ash in the fall, where they are to stand, and somewhat thicker than needed for a permanent stand, as it is easier to thin out when too thick than to replant any vacancies which may occur from failure in seed.

In forming timber lots, plant in rows four feet each way, and cut out as the trees enlarge and interfere. Cultivation should be such as is required for corn, each year, until plowing becomes impracticable on account of the size of the trees.

Do not think field and garden crops are benefited by any protection afforded by shelter-belts planted *near* them.

The growing of timber can be made profitable in almost any part of the State, should Black Walnut and Catalpa be planted.

The oldest successfully-planted timber lots in this county are now ten to twelve years of age, and were planted on upland.

BY S. H. HALL, DELIGHT.

The varieties of forest trees which succeed in this county, named in the order of preference, are Cottonwood, Black Walnut, Box Elder, Hackberry, Ash, and Osage Orange. Those valuable for timber, Walnut and Cottonwood; for shelter-belts, Cottonwood, Box Elder, and Osage Orange.

Preferred for lowlands, Walnut, Box Elder, Hackberry, Ash; for uplands, Oak, Cottonwood, Box Elder, Osage Orange, Soft Maple, Black and Yellow Locust.

Land designed for timber trees should be cultivated two or three years, by deep plowing and harrowing.

Varieties of trees easily propagated by cuttings are the Cottonwood and Lombardy Poplar; by seed, Walnut, Maple, Ash, Box Elder, Hackberry.

The seeds of nearly all classes should be planted as soon as ripe. If for spring planting, gather in fall, pack them in sand, and store in a cellar free from mice. Soft Maple, Elm and Poplar seed ripen in late spring and early summer, and must be planted as soon as they drop from the trees. The seeds of Hard Maple and Ash should be gathered and placed in a shady place and partially dried, then put into coarse sacks, and stored in a cool place until spring.

In forming timber lots, trees should be planted in rows, four feet apart each way, and well cultivated each year the same as corn.

Field and garden crops are undoubtedly benefited by the protection of timber belts.

The growing of trees for timber can be made profitable on any of the western prairies where native timber is scarce.

The oldest successfully-grown timber lots in the county are eight or nine years old; were planted on bottom lands, and are principally Cottonwood. The average diameter of the trees is about one foot.

ELK COUNTY.—BY HENRY WELTY, ELK FALLS.

The following list of trees has been successfully planted and grown in this county: Walnut, Cottonwood, Maple, Catalpa, Box Elder, and Lombardy Poplar, and are named in the order of success. Those valuable for timber, Walnut, Cottonwood, and Maple; for shelter-belts, Cottonwood, Maple, and Box Elder.

The Walnut, Maple and Cottonwood are preferable for lowlands; Cottonwood, Catalpa, and Lombardy Poplar are better adapted to uplands.

Land designed for timber lots should be prepared the same as that required for a corn crop.

Those varieties easily propagated by cuttings are the Cottonwood and Lombardy Poplar; by seed, Catalpa, Walnut, Maple, and Box Elder. Cuttings are the best made in March, and should be planted as early as the ground can be properly prepared. Plant Walnut seed in the fall, Box Elder in early fall, and Maple as soon as ripened in the spring. All seeds other than nuts are more easily grown in nursery from the first year.

Distance to plant: In forming a timber lot, vary according to the vigor of the variety of trees. Some do better four feet apart, while others need twelve feet. Cultivate the first and second year after planted as for corn. The third year cut out the weeds, after which they will thrive without any cultivation.

Timber belts on the south and west sides of the field and garden are a great benefit to the crops.

The scarcity of native forests in a large portion of the State will make investments in timber growing profitable.

There are but a few timber lots in this county more than two years old. There are several timber belts seven to nine years old, and are on both upland and lowland; were planted with Cottonwood, Maple, Box Elder, Walnut, and Lombardy Poplar. The oldest belts are of Cottonwood and Maple. The average diameter of the Cottonwood is one foot, and of the Maple eight years old, ten inches.

FRANKLIN COUNTY.—BY DR. ISAIAH PILE, OTTAWA.

The following classes of forest trees have been successfully planted and grown in this county, and are listed in the order of their success: Walnut, Cottonwood, Maple, Ash, Elm and Sycamore. All are valuable for fuel, and some for timber. Any variety of forest or fruit trees is suitable for shelter-belts.

All of the foregoing list succeed on lowlands. The Walnut and Cottonwood are most suitable for upland culture.

Land designed for forest trees should be clean and as free from weed-seeds as possible. Before planted, plow it deep and harrow thoroughly.

The classes of trees easily propagated by cuttings are Cottonwood, Lombardy Poplar, and Balm of Gilead. Those by seeds, Walnut, Box Elder, Maple, Ash, and Elm. Walnuts should be planted in autumn as soon as gathered, and require no preparation. Box Elder, Maple, Ash and Elm should be gathered as soon as ripe, in spring and summer, and planted immediately. I prefer to make cuttings just at the time the sap starts in spring. Have the land prepared and plant them at once. Any exposure to sun and wind after they are cut, results injuriously. If planted in nursery form, the rows should be about four feet apart, to admit of an easy culture.

For timber lots and groves: Set in rows ten feet apart, and thin out as growth in after years may require. Keep up cultivation with plow and hoe until the trees become so large that they prevent such work.

I do not think that timber-belts are any protection to crops.

From the evidence we have, timber-growing can be made profitable in this county.

The oldest successfully-grown timber lot or grove grown in this county is twenty-two years old, and was planted on upland; composed mostly of Cottonwood.

HARPER COUNTY.—BY M. O. MEIGS, ANTHONY.

Of the classes of forest trees, only Cottonwood has been successfully planted and grown. Some planters are starting the Walnut, Maple, and Box Elder.

All the foregoing varieties are adapted to either upland or lowland, so far as the few years tried indicate.

The Cottonwood propagates easily by cuttings, and the Walnut, Maple and Box Elder, by seed. Cuttings must be planted early in the spring, Walnuts in autumn, Box Elder in the spring, and Soft Maple, which ripens generally in May, as soon as the seed drops from the trees.

The oldest forest trees planted in this county are now only three years of age, and are Cottonwood. These were planted on second, sandy bottom land, and now average three inches in diameter, and from eight to twelve feet in height.

HARVEY COUNTY.—By Myron Hall, Newton.

Of forest trees that have been successfully planted and grown in this county, the Cottonwood, Box Elder, Walnut, Red Elm, Hackberry, White Ash, Soft Maple and Lombardy Poplar are the most reliable. Varieties preferable for lowlands, Cottonwood, Box Elder, Walnut, Red Elm, Hackberry, and White Ash; for uplands, Cottonwood, Hackberry, Soft Maple, Walnut, Lombardy Poplar, White Ash.

Land for forest trees should be thoroughly subdued by deep plowing and pulverizing.

The following varieties are easily propagated by cuttings: Cottonwood, Lombardy Poplar, Balm of Gilead, and White Willow; by seeds, Soft Maple, Box Elder, Black Walnut, White Ash, Hackberry, Elm, and Honey Locust. Cuttings can be made any time from December 1st to March 1st when the wood is not frozen. Strong one-year-old wood is preferable; cut into sections eight to ten inches long, and bury in earth until ground becomes warm in spring. If they are then to be used in forming timber lots, set in rows eight to ten feet apart, and one foot in the rows, and thin out in after years.

Seeds of Black Walnut, White Ash, Box Elder, Wild Cherry and Redbud had better be planted in fall, in rows four feet apart, and in nursery form, covering them about two inches deep. Soft Maple and Elms plant as soon as the seed ripens, about the first of June, in rows four feet apart; cover two inches deep with mellow earth, and give careful culture the first year.

The cultivation of timber lots should be kept up until the trees so shade the ground as to prevent weed growth.

Field and garden crops thrive better when protected by timber belts.

Timber growing can be made a profitable investment.

The age of the oldest successfully-grown timber lots in this county is now eight years; were planted on upland, and composed of Cottonwood and Box Elder. The average diameter of these is six to eight inches, and from thirty-five to forty feet in height.

JACKSON COUNTY.—By W. D. Barnett, Holton.

Of classes of forest trees, the following have been successfully planted and grown in this county, and are named in the order of their success: Cottonwood, Box Elder, Walnut, Poplar, and White Willow. Varieties valuable for timber, Cottonwood, Box Elder, Walnut; for shelter-belts, Cottonwood, White Willow, Box Elder, Poplar, and Walnut.

All of the foregoing succeed on upland or lowland.

The preparation of land designed for forest trees should be the same as for a crop of corn.

Varieties easily propagated by cuttings are Cottonwood, Poplars, and Willows; by seed, Black Walnut and Box Elder. The fall is a preferable time for planting such seeds as are benefited by freezing. If not planted in the fall, pack in some moist material, and plant in spring as early as possible.

Cuttings may be made in fall or spring; if in fall, bury entirely under ground until spring, and then plant in nicely-prepared ground. These should be cut from eight to ten inches in length.

In forming timber lots, set the trees in rows from four to five feet apart, and somewhat thicker in rows, and thin out in after years as becomes necessary to give space to others. When planted in nursery, to be grown for transplanting, the culture should be the same as for hoed crops. In groves, shelter-belts and timber lots, keep up a strong, vigorous growth by thorough cultivation until they are large enough to shade the ground.

I do not favor shelter-belts around fields, gardens, and orchards. They cut off free circulation of air, which is necessary for wood and fruit.

I am convinced that timber culture can be made profitable in Kansas.

The oldest successful timber lot in this county is now twelve years; was planted on upland, and mostly of Cottonwood and Walnut. The average diameter of the Cottonwood trees in this lot is eight to twelve inches, and thirty to forty feet in height; the Walnut, three to five inches, and six to twelve feet in height.

JEFFERSON COUNTY.—By J. N. Hall, Oskaloosa.

The following classes of forest trees have been successfully planted and grown in this county, and succeed in the order named: Cottonwood, Soft Maple, Walnut, and White Elm. Those varieties valuable for timber, in the order preferred, are the Walnut, Soft Maple, Cottonwood, and White Elm; for shelter-belts, Cottonwood, Soft Maple, and White Elm. All succeed on upland or lowland.

The land for forest-tree plantations should be as thoroughly prepared as for a fruit-tree orchard, by deep plowing and pulverizing.

Of forest trees, the Cottonwood is easily propagated by cuttings, and Walnut, Elms and Maple by seed. Gather Walnuts in the fall; spread them out on a smooth piece of land, and cover about half of an inch deep with earth, and allow them to remain until early spring; plant in rows where they are to grow into trees, or plant them in the fall in rows where they are to stand, and cover as above stated. Maple seed ripen the latter part of May. Gather them as soon as they drop from the trees, and plant at once, in rows six to eight feet apart and one foot apart in the row. Stretch a line across the land where the row is to be; drop one seed, with the winged end up, in a hole made with the finger, and press the ground down around it, and so continue until the job is finished. Cuttings can be made any time in winter, when the wood is not frozen.

Cultivation: Keep the land free from weeds, and mellow with plow and hoe each year until trees are large enough to shade the land.

The oldest successfully-grown timber lots in this county are now twenty-five years of age; were planted on both upland and lowland, and of Soft Maple. The average diameter of these trees is about ten inches, and height thirty feet.

JEWELL COUNTY.—By E. T. Byram, Jewell City.

Cottonwood, Box Elder, Walnut, Ash and Soft Maple trees have been successfully planted and grown in this county, and are named in the order of their success. Those varieties valuable for timber, in order of preference, are Ash, Walnut, Box Elder, and Cottonwood; for shelter-belts, Cottonwood and Box Elder.

All of the foregoing, including Elms, are adapted to lowlands, and excepting Elms, to uplands. Nine-tenths of all timber trees planted are Cottonwood.

Land to be planted to forest trees requires thorough and deep plowing, and should be fully subdued by cultivation at least one year before. With the exception of Cottonwood and Willow, all classes succeed best by propagation from seeds. These can be easily propagated by cuttings, which should be taken from the trees at the time the buds begin to swell in spring-time, and set at once.

In forming timber lots, set trees in rows eight feet apart, and in the row not more than three feet. Cultivation should be constant and thorough during the fore part of the season, and mulch the latter part. After trees are four or five years old, if their growth has been what it should be, cultivation may safely cease.

Timber-belts afford a beneficial protection to field and garden crops, if not constructed too densely.

There is no doubt a profit in growing timber, and certainly is it so when grown for shelter and fuel.

The age of the oldest successfully-grown timber lot in this county is now eight years. There are several fine lots not over six years old; these are largely Cottonwood, and located on both upland and lowland. The average diameter of the trees in the first lot is about ten inches, and height thirty feet.

JOHNSON COUNTY.—By E. P. Deihl, Olathe.

The classes of forest trees successfully planted and grown in this county, and named in the order of success, are Cottonwood, Walnut, Poplar, Maple, Ash, Box Elder, and Catalpa. Those valuable for timber are the Catalpa, Walnut, Cottonwood, Ash, Box Elder, Elm, and Maple.

Varieties preferable to plant on lowlands, Willow, Cottonwood, Maple, and Poplar; for uplands, Catalpa, Walnut, White and Blue Ash, Cottonwood, Poplar, Box Elder.

Land designed for forest trees should be thoroughly prepared as required for other classes.

Propagation: Varieties easily propagated by cuttings are the Cottonwood, Lombardy Poplar, Willow, and Balm of Gilead; by seed, Walnut, Hickory, Ash, Maple, Box Elder, Elm, Catalpa, and Osage Orange. Walnut, Hickory, Pecan and Chestnut seed should be planted in the fall, or packed in moist earth, and stored in a cool place until time for planting in the spring.

Freezing is an advantage to these seeds. Ash should be gathered in autumn, and stored until spring. Elm and Maple ripen their seed late in spring or fore part of summer, and must be planted soon after they drop from the tree; should they become anyway dry, soak twenty-four to forty-eight hours in warm water. These seeds require a light covering—not over one and one-half inches—with well-pulverized earth.

In forming timber lots, plant in rows four feet apart each way; cultivation, either in nursery or permanent rows, should be thorough during the fore part of the season, and cease by July 1st, to afford trees an opportunity to mature the season's growth. With timber lots, continue cultivation three or four years; after that the trees should be strong enough to require no further care, other than to thin out whenever they interfere.

Field and garden crops thrive better when protected by timber-belts.

The oldest successfully-grown timber lot in this county is now twenty-one years, and growing on upland. It is composed of Cottonwood, Walnut, Maple, Poplar, and Willow. The average diameter of these varies as to varieties from eighteen to twenty inches, and are thirty-five to forty feet in height.

We have sufficient evidence that timber growing can be made profitable.

KINGMAN COUNTY.—BY L. W. LEACH, KINGMAN.

Forest trees have been successfully planted and grown in this county. Varieties valuable for timber are the Black Walnut, Catalpa, Honey Locust, Box Elder, Ash, and Maple; for shelter-belts, White Willow and Cottonwood. These last two are most suitable for planting on lowlands. Varieties adapted to the uplands are Black Walnut, Ash, Catalpa, Box Elder, and Maple.

Preparation of land before planting should be thorough, by plowing and pulverizing.

Propagation by cuttings: The Cottonwood, Willow and Lombardy Poplar are easily grown from cuttings, which should be made from the last year's growth, about ten or twelve inches long. The wood for cuttings should be taken from the tree just as the buds begin to swell, and planted as soon as possible thereafter.

Seeds—their treatment: Walnuts should be placed in the ground or in a box of sand as soon as possible after gathered, to insure their germination. They may be bedded on the ground and covered with soil three to four inches deep, and remain until spring, and then planted where they are to grow into trees. Ash, Catalpa and Box Elder may be planted in April or early May, in drills. Smaller seeds, as the Catalpa, should not be covered more than half an inch deep. Box Elder and Locust should be soaked three or four days in warm water before planting.

In forming shelter-belts or lots, trees and cuttings should be planted in rows four to six feet apart, and thin out as their growth requires it. Cultivation should be the same as required for corn. Keep all weed growth subdued and the ground mellow until the trees shade the land.

Field and garden crops, also the orchard and plantations of small fruits, all thrive a great deal better when protected by timber.

I am satisfied that investments in timber growing can be made profitable in this county.

The oldest lots in this county are now only four years old, and the average diameter is four inches, and height twenty-five feet. They are located on lowlands, and composed of Cottonwood and Box Elder.

LABETTE COUNTY.—By J. L. Williams, Oswego.

The following classes of forest trees have been successfully planted and grown in this county, named in the order of success: Cottonwood, Soft Maple, Lombardy Poplar, and Walnut. Those valuable for timber are Walnut, Cottonwood, Maple, and Lombardy Poplar; for shelter-belts, Soft Maple.

All the foregoing varieties are adapted to uplands.

Land designed to be planted with forest trees requires same preparation as for a corn crop.

Varieties easily propagated by cuttings are Cottonwood and Lombardy Poplar; by seed, Maple and Walnut. Gather Walnuts in the fall and plant at once, in rows four feet apart and four feet in the row. Soft Maple seed at time of ripening, in the spring, and sow as soon as possible, in rows four feet apart and about two inches in rows, and cover one inch deep. All cuttings may be taken from trees in March and planted soon after, in rows four feet apart and three inches in the row. The cuttings should be about six inches in length. Cultivate all classes the same as corn each year until they shade the ground.

Field and garden crops thrive better when protected by timber belts than when not.

The oldest successfully-grown timber lot in this county is now ten years; was planted on upland, and composed of Maple, Lombardy Poplar and Cottonwood. The average diameter of the trees in this lot is six to ten inches, and their height forty feet.

There exists an abundance of evidence that investments in timber culture can be made profitable in the county.

LEAVENWORTH COUNTY.—By E. J. Holman, Leavenworth.

The following classes of forest trees have been successfully planted and grown in this county, and are named in the order of their success: Cottonwood, Soft Maple, Walnut, Sycamore, and Sugar Maple; varieties valuable for timber, Walnut, Cottonwood, and Maple.

Preferable for lowlands and uplands, Sugar Maple, Walnut, Sycamore, and Cottonwood.

Land intended for forest trees should be thoroughly prepared by plowing and harrowing before planted.

The classes that are easily propagated by cuttings are the Cottonwood, Linden, Poplar and Willow; by seeds, nut-bearing classes, Maples, Sycamore, Catalpa, Ash, Cypress, and Elm. Soft Maple seed must be planted as soon as they ripen in spring. Seeds of all nut-bearing trees should be planted in the fall, while Catalpa and its like do best planted in the spring.

In forming timber lots, plant the trees in rows five feet apart each way, and thin out as their growth causes them to interfere. The culture each year until the trees are large enough to take care of themselves, should be such as will conduce to a healthy, vigorous growth.

Field and garden crops thrive much better when protected by timber-belts than when exposed.

Timber groves were planted in 1860, of Cottonwood chiefly, and on upland, many of which are fifty feet high. Some of them have been cut down, and yielded one cord of wood to a tree.

Timber-growing can be made a profitable investment. I have a row of deciduous Cypress now eleven years old which will measure twenty feet in height and ten inches in diameter. Ten acres of such, in a generation, would be of immense value.

LINCOLN COUNTY.—By Jacob Weidman, Pleasant Valley.

The following classes of forest trees have been successfully planted and grown in this county, and are named in the order of their success: Cottonwood, Box Elder, White Ash, Red and White Elm, Black Walnut. Those valuable for timber are White Ash, Cottonwood, Walnut, Red and White Elm, Box Elder; for shelter-belts, Cottonwood, White and Red Elm.

Varieties preferable for lowlands, Cottonwood, Ash, Walnut, Red and White Elm, Hackberry, Box Elder; adapted to uplands, Cottonwood, Ash, White Elm, Native and White Mulberry, Soft Maple, Osage Orange, and Black Locust.

Land to be used for timber lots must be well prepared—bottom land, by common plowing and harrowing; upland will require a subsoil stirring.

Varieties of trees easily propagated by cuttings are the Cottonwood, Golden and Native Willows; by seed, Red and White Elm, Ash, Box Elder, Black Walnut, Mulberry, and Osage Orange. Elm seed requires planting as soon as ripe, which occurs about the time that the leaves of the tree are full grown. Plant Walnuts in the fall, soon after ripened. Ash, Box Elder and Osage Orange seed gather in autumn and store until the middle of March, then pack in a box with fine sand, in the proportion of one part seed and two parts sand, mix thoroughly, moisten throughout, and cover the top of the seeds with a layer of sand about three inches thick; set the box in the ground in a warm, sunny place, and in three or four weeks the seed will be in a suitable condition to plant. Elm seed ripens during the middle of May; Cottonwood, from the first to the middle of June, and should be planted at once. Mulberry seed ripens the latter part of June, and may be planted then or kept over until the latter part of the next April; soak in damp sand four days, and then plant. Ash and Box Elder may be planted in the fall, when ripe

Cuttings: The best time to procure these is in the fall, and before hard-freezing weather; use the best summer growths, and from young, thrifty trees, cut into sections of one foot in length, tie in bundles of fifty, pack in damp sawdust, sand or moss, and store in a medium-cool cellar. Treated in this way, they will callous at the base end by planting-time in spring. Fall-prepared cuttings make a much better plant, and are not so liable to fail during a dry spell in summer as those made in spring-time. Set about the time buds on trees begin to swell, leaving only two buds above ground, and at an angle of forty-five degrees.

In forming timber lots, plant in rows eight feet apart, and four feet in the row. When planted in nursery form, select new and well plowed, mellow land. Osage Orange seed, drill in rows two feet apart, and about two inches apart in the row; Elm, one inch; Ash and Box Elder, one inch and a half. Keep clear of weeds by constant culture until first of July, and then stop, to give the plants a chance to ripen up before winter sets in.

For timber lots, plant in rows eight feet apart, and four feet in the row. Grow corn between the rows, as it will cause the trees to form straighter and more erect bodies. Allow the corn-stalks to remain standing through winter, as they will retain on the ground the falling snow, and thus be the means of furnishing moisture for summer uses. All culture should cease by July 1st, each year, and entirely, whenever the trees shade the land.

Field and garden crops thrive better and are much surer when protected by timber-belts.

The age of the oldest timber lots in this county is seven years; are planted on upland, lowland, and second bottom; are composed of Cottonwood, Box Elder, and Black Walnut. The average diameter of the Cottonwood is seven inches, with a height of twenty feet; Box Elder is sixty per cent. smaller; and Walnut, about one-third the size of the Cottonwood.

Timber growing is a necessity in this county, and can be made profitable.

(This report is substantially sustained by similar reports made to this office by such practical forest-tree planters as John R. Hill, of Vesper, and Smiley Green, of Lincoln, Lincoln county.—Sec'y.)

BY L. L. ALLEN, GOLDEN BELT.

The following varieties of forest trees are preferable for upland planting, Catalpa, Cottonwood, Maple, Lombardy Poplar, and Red Cedar. Oaks made a growth of seventeen inches last year from seed. For lowland, Cottonwood, Ash-leafed Maple, Black Walnut, and Ash.

Land selected for forest-tree planting requires the same preparation as would produce a first-class crop of corn before planted.

Propagation: The Lombardy Poplar and Cottonwood are easily grown from cuttings, which should be made in the spring before buds start; cut them about one foot in length.

Seeds: Those of Black Walnut and Oak should be planted in the fall; Catalpa in spring, about the time the buds start; Soft Maple as soon as ripe, which occurs the last of May; Cottonwood seed as soon as ripened, which is about the last of June. Remove the cottony substance from around the seed; plant in rows, and cultivate as is necessary for garden vegetables.

The Cottonwood, Soft Maple or Mountain Cedar are preferable for timber-belts. Set in rows eight feet apart, and two feet in the rows. Some prefer to plant in rows four feet apart each way, and give the same culture required for corn. The Black Walnut makes finer trees when grown three years, and then cut back to the ground; cultivate two years more, and they will take care of themselves thereafter. Cottonwood and Maple should receive good culture during the first six years, when it may safely cease.

Field and garden crops thrive much better where grown under the protection of timber-belts.

The oldest successfully-grown timber lot, grove or belt in this county is three years from planting; was planted on upland, and composed of Cottonwood, Ash-leafed Maple (Box Elder), Catalpa, Beech, Ash, Soft Maple, and Red Cedar. This covers ten acres. The Black Walnuts were cut back as herein recommended. The average measurement at this date is as follows: Cottonwood, four inches in diameter, twelve feet in height; Ash-leafed Maple, two and one-half inches in diameter, and seven feet in height; Soft Maple, three inches in diameter, and nine feet in height; Beech, one and one-half inches in diameter, and two feet in height; Cedar, one and one-half inches in diameter, and one and one-half feet in height.

LYON COUNTY.—By Robt. Milliken, Emporia.

Of the several classes of forest trees planted in this county, the following have been successful in the order named: Cottonwood, Walnut, Elm, Box Elder, Ash, Willow, Honey Locust, Coffee-bean and Osage Orange. Those varieties most valuable for timber, Osage Orange, Catalpa, Walnut, Ash, Honey Locust; for shelter-belts, Cottonwood, Box Elder, and Walnut.

All of the foregoing except the Maple succeed tolerably well on upland, but none as well as on bottom land.

Land that is to be used for timber growing must first be deeply plowed and thoroughly pulverized.

Varieties easily propagated by cuttings are the Cottonwood and Willows; by seed, Elms, Ash, and Box Elder, and nut-bearing kinds.

Elm and Maple seed require planting as soon as ripe, which occurs the latter part of May or fore part of June. Walnut and Hickory nuts and Oak, bed out in the fall and let them so remain until early spring, then plant. Locust, Red-bud and Coffee-bean, scald, and plant in the spring.,

Cuttings do best when made in autumn and buried in the ground until spring.

Cultivation of forest trees of any age should be thorough, and such as will produce a vigorous and healthy development of wood growth. With timber lots it should be kept up through each successive year until such an age as the growth will interfere and render it impracticable.

The age of the oldest successfully-grown timber lot in the county is now twenty-two years; was planted with Cottonwood, on lowland. The average diameter of these trees is twenty-five inches, and their average height, sixty feet.

Timber growing for profit has not been considered a paying investment in this county.

MARSHALL COUNTY.—BY JOHN MCKEE, MARYSVILLE.

Of forest trees, the Cottonwood, Box Elder, Willow, Silver Maple, Soft Maple, Ash, Locust, Walnut, Mulberry, Hickories and Oaks have all been successfully grown, and are valuable for timber and shelter-belts.

These succeed on upland and lowland, with the exception of Willow.

The preparation of land for forest-tree planting should be by deep plowing and thorough pulverization.

Classes easily propagated by cuttings are the Cottonwood, Box Elder, Willow, Silver Maple and Lombardy Poplar. Such as require to be grown from seed are Soft Maple, Ash, Locust, Walnut, Mulberry, Hickories, and Oaks.

Planting of seeds: Soft Maple require planting as soon as they ripen, which is in May. Mulberry may be sown at time of ripening, which is in July, or the fruit can be dried, and sown the following spring. Ash, sow in spring. All nut-bearing varieties, sow the seed in autumn. Such classes as produce fine seed it is best to sow in a seed-bed in spring, or in nursery form, as it is more convenient to keep weeds removed.

For timber lots, plant in rows, ten feet apart, and cultivate each year until the trees shade the ground.

Field and garden crops thrive better when protected by timber-belts.

The oldest successfully-grown timber lot in the county is now about twelve years of age; was planted on upland, and composed of Cottonwood trees entirely. Their average diameter is now nine inches, and height thirty-five feet.

If each farmer would grow from ten to fifteen acres of timber on his farm it would prove a profitable investment.

MIAMI COUNTY.—BY L. BISHOP, OSAWATOMIE.

The classes of forest trees successfully planted and grown in this county are the Cottonwood, Soft Maple, White Elm, Black Walnut, and Catalpa, Hard Maple, White Ash, and Box Elder. Evergreens, the Red Cedar, and White Pine. These succeed in the order named. Those valuable for timber, Catalpa and Black Walnut; for shelter-belts, any of the above named will answer, but prefer such as are good for timber.

Preferable for planting on lowlands, the Catalpa, Black Walnut, Cottonwood, Box Elder, Soft Maple, White Elm, White Ash, and Honey Locust.

Adapted to uplands, all the foregoing except Cottonwood, and to which add Hard Maple, Red Cedar, and White Pine.

The same preparation of land given for a corn crop is required for forest trees.

Propagation by cuttings: The Catalpa and Cottonwood are easily grown; by seeds, Catalpa, Black Walnut, Soft Maple, Honey Locust, White Ash, White Elm, and Box Elder.

Seeds of Catalpa, White Ash and Box Elder should be gathered in autumn or during winter. Plant the Catalpa in drills the last of April or first of May, and cover about three-fourths of an inch deep; they require no special preparation. The others, plant in same manner, but as early in spring as possible. These may be planted in fall. Black Walnuts, plant in fall, or bed in the ground, covering them about two inches deep, and plant in early spring; should be planted where the tree is to remain permanently. Soft Maple seeds ripen in May; plant at once. Gather Honey Locust in the fall, and bed out the same as Black Walnut, and plant in spring before they sprout. Seeds of White Elm and Hard Maple are difficult to gather. Young plants can be found in abundance in the vicinity of old trees along the water-courses, and may be transplanted to nursery rows and there grown for two or three years; then plant in groves and belts. The White Elm, though good for nothing else, is excellent for these purposes; will succeed under more neglect than any other variety.

Cuttings: Prepare in the fall from the current year's growth; cut them eight to ten inches long, tie in small bundles and bury lightly in the ground where no water will stand, and set in the spring in nursery rows, leaving only one bud above ground. Cultivate thoroughly through one or two years, then transplant to places where wanted to form wind-breaks, groves or timber lots, in rows six to eight feet apart and two feet in the rows. Cultivate each year until their growth forms a shade to the land sufficient to smother out weed growth.

Timber-belts exert a beneficial influence from the protection afforded to field and garden crops, but care should be given in their planting that they are not less than three or four rods distant from all crops.

The oldest timber lots successfully planted in this county are now twenty-one years of age, and are generally on the uplands. In these are Cottonwood, Soft Maple, and Black Walnut. The average diameter of Cottonwood, two feet, height fifty feet; Soft Maple, diameter eighteen inches, forty feet in height; Black Walnut, diameter one foot, and twenty-five feet high.

From the past evidence, I conclude that timber culture can be made profitable, even in this county, where Nature had furnished a plenty at the time of its settlement.

MITCHELL COUNTY.—By E. A. Taylor, Beloit.

The following classes of forest trees have been successfully planted and grown in this county, and are named in the order of their success: Honey

Locust, Cottonwood, Black Walnut, Box Elder, Red and White Elm, and Osage Orange. Those valuable for timber, Honey Locust, Black Walnut, and Osage Orange; for shelter-belts, Cottonwood and Box Elder.

Preferable for lowlands, Elm, Cottonwood, and Box Elder; uplands, Honey Locust, Black Walnut, Cottonwood, Osage Orange, and Elm.

Land designed for forest trees should be deeply plowed and thoroughly pulverized.

Classes easily propagated by cuttings are Cottonwood, Lombardy Poplar, Balm of Gilead, and Willows; by seed, Black Walnut and Osage Orange. Black Walnuts should be planted in the fall, and covered two inches deep, or bedded out and frozen and planted in the spring. Locust and Osage Orange seed, soak two weeks in spring, and plant, covering one inch deep. Box Elder seed, plant either in spring or autumn, and cover from one to two inches deep. Cuttings should be made in fall, before any hard-freezing weather, about six to ten inches long, tied in bunches of fifty or one hundred pieces, and buried in trenches with butt end down; cover with soil two inches deep. Plant early in spring. If seeds are to be planted in nursery form, lay off the rows four feet apart, and drop two inches in the row. Cuttings, plant in rows same distance as seeds, and set with a spud or dibble so deep that only the top bud will be above ground.

For timber lots, plant in rows six feet apart, and in the row two to three feet, and cultivate the same as for corn until six years old.

Timber belts around fields and gardens are beneficial to the crops if sufficiently distant as not to shade them.

The oldest successfully-grown timber belt in this county is now ten years of age; was planted on upland, and composed of Cottonwood. The average diameter of these trees is six inches, and twenty feet in height.

Forest-tree growing for the timber alone is not profitable, but for that and its influence on the climate, such an investment would be valuable.

McPHERSON COUNTY.—BY THEO. BOGGS, MCPHERSON.

The Catalpa, Black Walnut, Cottonwood, Gray Willow, Osage Orange and Box Elder have been successfully planted and grown in this county, and are named in the order of success. They are all valuable for timber excepting the Cottonwood; for shelter-belts, the Gray Willow and Cottonwood are preferable.

The Gray Willow, Cottonwood and Black Walnut are most suitable for lowland planting, and the Catalpa, Black Walnut, Osage Orange and Box Elder for uplands.

Land for all classes should be deeply plowed and pulverized before planted.

Propagation of the Catalpa, Cottonwood and Gray Willow is easily effected by cuttings. The Catalpa is grown readily from seeds, as are Black Walnut, Box Elder, and Osage Orange. Catalpa and Box Elder seed should be planted in the spring, Black Walnut in the fall, or frozen during the winter and planted in early spring. Osage Orange must be soaked and frozen a few weeks before planted, which should be in the spring. Cuttings of Cottonwood and Gray Willow should be planted in deeply-prepared ground in the spring. For a nursery culture, set in rows two feet apart, and eight to twelve inches in the row.

In forming timber lots, trees should be set in rows six to eight feet apart; cultivate thoroughly each year, until the shade of the trees prevents weed growth, with plow, and when necessary, use a hoe.

Field and garden crops invariably thrive better when protected with timber-belts, planted sufficiently distant as not to shade them.

The oldest successfully-grown timber lot in this county is now twelve years of age; was planted on bottom land, and composed mostly of Cottonwood. The average diameter of these trees is fourteen inches.

Timber growing can be made a profitable investment in the county.

MONTGOMERY COUNTY.—BY J. OVERFIELD, INDEPENDENCE.

The classes of forest trees that have been successfully grown in this county, and here listed in the order of success, are Cottonwood, Soft Maple, Catalpa, Ash and Walnut, and are all valuable for timber, in the following order: Catalpa, Walnut, Maple, and Cottonwood. These are all good for shelter-belts.

The Cottonwood, Ash and Walnut are preferable for planting on lowlands, and Catalpa and Maple for uplands.

Land intended for forest trees should be plowed deep and thoroughly pulverized.

The Cottonwood propagates easily by cuttings, while the Catalpa, Walnut, Ash and Maple require propagation by seed. Catalpa and Ash seed should be gathered in the fall and planted in the spring. Black Walnuts, gather and plant in the fall, where they are to form trees. Soft Maple seed ripen the 1st of May in this latitude, and require planting at once, not allowing them to dry. All seeds and cuttings can be grown in nursery form the first year to an advantage, excepting the Black Walnut, which does not safely transplant. Plant in rows, four feet apart and one foot in the row.

For timber lots, plant in rows four feet each way, and as the trees require room for growth, thin out. Cultivate as often as once each week, with cultivator, and when necessary to subdue weeds use a hoe around the trees. Keep up this culture until the growth prevents such work.

Field and garden crops thrive much better when protected by timber-belts.

The age of the oldest successfully-grown timber lot in this county was planted with seed ten years ago, on upland, and is composed of Maple, Catalpa, Ash, Walnut, and a few Cottonwoods. The average height of the Maples is about thirty feet, and diameter twenty inches. The Catalpa are sixteen inches in diameter, and the Cottonwood is larger than either.

MORRIS COUNTY.—By F. B. Harris, White City.

The following classes of forest trees have been successfully planted and grown in this county, and are named in the order of success: Cottonwood and Black Walnut. These are valuable for timber; for shelter-belts, the Cottonwood is preferable, because of its rapid and upright growth.

Preferable for lowlands, such as are found in our native forests, which are easily propagated; for upland, the Cottonwood is the hardiest; Maple and Box Elder are adapted, but are liable to the attacks of borers during drouths.

Land for forest-tree plantations should be thoroughly subdued by at least three years' cultivation—five would be better—before planted. Enrich thoroughly the year preceding planting. The success of timber growing depends largely upon the thrift of the trees while young.

The Cottonwood and Lombardy Poplar propagate easily by cuttings. All cuttings should be made late in fall, and from the current year's growth; tie them in bunches of fifty each, and bury in moist ground, with the butt ends down; in the spring, just before the Cottonwood trees start their leaves, plant in rows the distance apart desired, leaving about one inch above ground.

Seeds: Those of the Black Walnut and Hickory should be gathered in the fall; layer them with earth, in leaky barrels; store on the north side of a building, where they may thoroughly freeze; wet them occasionally to prevent drying out. Plant such seed as do not need freezing late in spring; keep these moist—not wet—through winter. Such as have been frozen should be planted early in the spring, in rows, where they are to form groves or belts. Cuttings should also be planted where they are to stand permanently.

In forming timber lots, plant rapid-growing classes, in rows six to eight feet each way; others, such as Walnut, Hickory, Elms, etc., set five feet each way. Walnut should be cut back to the ground at the end of the first years; makes a very rapid, straight growth thereafter. Cultivation should be thorough, with a horse cultivator, until the end of July, each year. This will afford sufficient time for trees to mature their wood for winter.

Field crops are benefited by the protection afforded by timber-belts, when planted around them; gardens, by a board fence constructed on the south side.

Timber can be profitably grown in this county.

I have a Cottonwood lot planted only four years, from which I obtain an abundant supply of fuel. The measurement of trees planted six years ago now shows a diameter of eight inches, and height twenty-five feet.

PRATT COUNTY.—By John Waldock, Saratoga.

The Cottonwood, Ash-leafed Maple and Black Walnut have been successfully planted and grown in this county. The first is preferable for lowlands, and the last for uplands.

Land selected for forest trees should be thoroughly subdued by several years of cultivation.

Propagation: All the foregoing classes are easily propagated by seed. The Cottonwood and Ash-leafed Maple may be grown from cuttings, which should be made and planted by the middle of March.

The oldest successfully-grown timber lot in this county is now three years, and composed of Cottonwood and Ash-leafed Maple. Their average height is five feet.

NESS COUNTY.—By Wm. Harding, Nevada.

The planting of forest trees in this county has been quite successful, considering that there have been two successive years of extreme drouth.

The Cottonwood, Box Elder, Elms, Ash, Walnut, Kentucky Coffee-tree and Ailantus succeed on both upland and lowland.

Land for forest trees should be plowed deep and thoroughly cultivated, and enriched with well-rotted stable manure.

Varieties easily propagated by cuttings are Cottonwood, Lombardy Poplar and Willow; by seeds, Walnut, Box Elder, Ash, Ailantus, and Kentucky Coffee-tree. Walnuts should be gathered in the autumn and planted before winter sets in; Coffee-beans should be gathered in the fall and planted early in the spring, after being scalded with boiling-hot water; Box Elder, gather in autumn, keep in a dry cool place until spring, then soak in water three days, and plant. Cuttings should be made by the middle of March, cut to about eight inches long, and planted soon after, in the place where they are to form a grove or timber lot. Walnut seed also require planting in the place for permanent growth, as the tree does not transplant easily. It is better to plant Ash and Box Elder seed in nursery form, in rows, four feet apart and five inches apart in the rows, until near two years old, and then transplant to permanent grounds.

In forming timber lots, set trees twelve feet apart each way. Cultivate shallow, until they are strong and well developed into trees, which, with Cottonwood, Ailantus and Lombardy Poplar, will be about three years, and other classes from four to five years.

Field and garden crops thrive better when protected by timber-belts on the south and west sides.

The oldest timber lot in this county is now three years of age; is planted on a south slope, between upland and lowland, and is composed of Cottonwood, Box Elder, Ash, and Ailantus. Owing to the drouth of the last two years, they are small, not more than one and one-half inches in diameter, and four feet high.

From my experience, timber growing can be made profitable in this county.

NEMAHA COUNTY.—By S. J. Edgerly, Seneca.

The varieties of forest trees successfully planted and grown in this county are as follows, named in the order of their success: Cottonwood, Soft Maple, Box Elder, Honey Locust, Walnut, and Elm. Those valuable for timber are Walnut, Honey Locust, Box Elder, Soft Maple, Osage Orange, Hickory, Elm, and Cottonwood; for shelter-belts, Osage Orange, Box Elder, Soft Maple, and Walnut.

Preferable for lowland planting, Box Elder, Soft Maple, and Elm, and all succeed on uplands.

Land for forest trees should be thoroughly plowed and harrowed before planted.

The Cottonwood is easily propagated by cuttings, and the following by seeds: Walnut, Soft Maple, Box Elder, Elm, Hickory, Catalpa. Plant Walnuts and Hickory nuts in a shallow furrow in the fall, and turn a light covering over them. Soft Maple seed ripen in May. Gather and plant in shallow drills as soon as they drop from the trees. Treat Box Elder seed in same way. Cottonwoods are generally planted by using the young plants dug in the native forests. For shelter belts and groves have used the Peach very satisfactorily, by planting the pits in autumn in shallow drills, and covering lightly with a plow. Cottonwood cuttings plant in trenches made with a plow; stand on end, leaning against one side, and turn a furrow against them; then straighten them up by hand and pack the earth firmly about them.

In forming timber lots, set the trees in rows eight feet each way; cultivate thoroughly with plow, and when necessary to clear of weeds, use a hoe, each year, until the trees are four years old, when it will be safe to cease culture.

In a new and unimproved prairie country, shelter-belts are an advantage to garden and field crops, by the protection they afford.

The oldest successfully-grown timber lot in this county is now of about twenty-three years growth; was planted on upland, and composed of Cottonwood. Their average diameter is two and one-half feet, and thirty-five feet in height.

I have all the firewood needed, and some fence posts and timber, from the Locust and Osage Orange on my farm for several years past, hence I conclude timber culture can be made profitable.

NEOSHO COUNTY.—BY G. W. ASHBY, CHANUTE.

Of the classes of forest trees planted in this county, Cottonwood, Soft Maple, Lombardy Poplar, Willow, and White and Red Elm have been successfully grown in the order listed. Those valuable for timber are Black Walnut, Ash, Catalpa, Oak, Hickory, and Ailantus; for shelter-belts, Willow, Cottonwood, and Soft Maple.

Any of the foregoing classes succeed equally on highland or lowlands.

Land for forest trees needs thorough preparation by plowing and harrowing.

Of the classes that propagate easily by cuttings, are Cottonwood, Willow, and Lombardy Poplar; by seeds, Soft Maple, Elm, Ash, Box Elder, Walnut, Oak, Hickory, and Catalpa. All cuttings should be made in early winter, one foot in length and of the current year's growth, tied in bunches of one hundred, and buried in a damp place until spring. Gather seeds of Ash, Box Elder, Catalpa and Ailantus in autumn as soon as ripe, dry them, and store for spring use; Soft Maple and Elm as soon as ripened, which is generally in May, and plant soon after. Seeds of all nut-bearing classes, gather as soon as they ripen, and avoid their drying until planted either in fall or spring. Plant Ash, Box Elder and Ailantus in early spring, and if in nursery form, sow in rows four feet apart; cover them lightly. The Soft Maple and Elm should also be covered lightly. Nuts and acorns, it is best plant in the fall where they are to stand, covering them about six inches deep. Cuttings should be set in early spring and in the permanent grove.

In forming timber lots, set the trees in rows eight feet apart, and quite thick in the rows. Cultivate thoroughly each year. Such culture as will grow a good crop of corn will produce good fruit trees. As farmers express it, the Cottonwood will be strong enough to "lay by" at three years old; Soft Maple, Willow, Elm, Poplar, Catalpa and Ailantus at four; Oaks, Black Walnut and Hickories at five years old.

Timber-belts planted on the south and west are beneficial by their protection to field and garden crops.

This county is quite young in its tree planting, and as a successfully-grown timber lot I will select one planted only eight years ago. This is composed of Soft Maple, Willow, Lombardy Poplar, Catalpa, Ailantus, Cottonwood, Box Elder, and Walnut. It was planted on upland. The trees now average as follows: Cottonwood, Soft Maple, Lombardy Poplar, six inches in diameter, and twenty feet in height; Ailantus, Catalpa and Willow five inches in diameter, and from ten to twenty feet in height, varying with varieties; Walnut, four inches in diameter, and ten feet in height.

Timber growing pays in this county.

OTTAWA COUNTY.—BY J. W. MCLAREN, SUMMERVILLE.

Forest-tree culture has been a success in this county. The Cottonwood, Walnut, Box Elder, Ash and Soft Maple have been successfully grown, and are preferred in the order named. Those valuable for timber, Cottonwood and Box Elder; for shelter-belts, are preferred the Cottonwood, Box Elder, and Walnut.

Those succeeding on lowlands are Cottonwood, Box Elder, Walnut, and Ash; on uplands, Walnut, Ash, Box Elder, and Soft Maple.

Land to be used in forest-tree growing should be prepared by deep and thorough cultivation, before planted.

Of the classes propagated easily by cuttings, are the Cottonwood and Lombardy Poplar; by seed, Walnut, Box Elder, Ash, and Soft Maple. Cuttings should be made in March, one foot in length, and from the last year's wood growth; plant as soon as possible thereafter. Plant Walnuts in the fall, or bury about three inches under ground, that they may keep moist and freeze during winter; then plant in early spring.

Gather seeds of Box Elder and Ash in autumn, and store in a dry place until spring, then plant. These may be planted in autumn. Soft Maple seed require to be sown as soon as ripe, which is generally in May. Cover the seed three inches deep; cover Box Elder and Ash seed two and one-half inches, and Black Walnuts about four inches deep.

Cuttings: Set late in the fall or early in spring, leaving about one inch above ground; press the earth down firmly about them.

In forming timber lots, set the trees eight feet apart and two feet in the row, and thin out whenever they become too thick. Cultivation should be kept up each year until their growth will shade the ground, and keep the weeds smothered out. If the grove is on good lowland, cultivation may safely cease with the Cottonwood and Walnut at the end of the third year; Box Elder and Ash in two years. If on poor upland, the first will require from six to eight years, the second five years, and the last two, (Box Elder and Ash,) four years.

Timber-belts, as wind-breaks, are an advantage to field and garden crops.

The oldest successfully-grown timber grove in this county is nine years of age. This is 100 rods long and constructed with four rows of Black Walnut, one rod apart, and the trees set in the rows one-half a rod apart. Lombardy Poplars were planted between each tree in the row, which were killed by the "hateful locust" or grasshopper in the spring of 1874. I filled in the vacancies with Cottonwood trees in the spring of 1875. The Black Walnut were grown in nursery rows, from seed, and transplanted to the grove. All grew except four of the trees. This grove was planted on upland. The average diameter of these trees is four inches, and height fourteen feet.

Not knowing what such timber is worth, I cannot determine that the investment has been a profitable one.

PAWNEE COUNTY.—By C. C. Chevalier, Garfield.

Forest trees which have been successfully planted and grown in this county are here named in the order of success: Ailantus, Honey Locust, Box Elder, Cottonwood, Black Walnut, Elm, and Gray Willow. Those valuable for timber are Ailantus and Honey Locust; for shelter-belts — any of the foregoing are good for such purposes, and succeed on lowlands; for uplands, the Ailantus, Cottonwood and Box Elder have passed the dry seasons better than others.

Land designed for forest-tree planting should be prepared by deep plowing, and subsoiled if possible.

Propagation by cuttings: Cottonwood, Willow and most of the Poplars are grown easily in this way; by seeds, Ailantus, Honey Locust and Box Elder. For planting, gather all such seeds as are ripe in the fall. Keep Ailantus over winter in a dry state. Honey Locust, Black Walnut, Box Elder and Ash should be packed in moist sand through winter, and planted early in spring. Cuttings may be made in mild weather any time during winter, and must be kept from drying until planted. Cut them ten or twelve inches in length; set so as to leave only an inch above ground, and press down the earth firmly around them.

In forming timber lots, set the trees in rows six feet apart, and in the rows two to three feet. Cultivate during the fore part of season each year, until the growth shades the land, and will smother out all weeds that may start.

Timber belts are decidedly beneficial to farm crops, in the protection they afford during the growing season.

The oldest successfully-grown timber lot or grove in this county is now five to six years of age; was planted on lowland, and composed of Ailantus, Honey Locust, Box Elder, and Cottonwood. Their diameter, taken at one foot from the ground, and their height, show an average as follows:

	Diameter.	*Height.*	*Age.*
Ailantus	3½ inches.	10 feet.	6 years.
Cottonwood	8 "	30 "	6 "
Box Elder	4 "	18 "	6 "
Honey Locust	5 "	14 "	5 "
Black Walnut	3¼ "	9 "	6 "
Catalpa	2 "	8 "	5 "
Gray Willow	4 "	18 "	6 "
Elm	3½ "	18 "	5 "
Soft Maple	2 "	8 "	4 "
Peach	2½ "	10 "	5 "

Timber growing can be made a profitable investment in this county, as evidence shows.

POTTAWATOMIE COUNTY.—By Jos. Leach, Havensville.

The Cottonwood, Soft Maple, Box Elder, Black Walnut, Ash and Honey Locust have been successfully planted and grown in this county, and succeed in the order listed. Those valuable for timber are the Ash, Walnut, Maple, Locust, Cottonwood, and Box Elder; for shelter-belts, Cottonwood, Maple, and Gray Willow.

Varieties preferable for lowlands, Cottonwood, Maple, Ash, and Willow; and for uplands, Ash, Maple, Box Elder, Walnut, Cottonwood, and Willow.

Land to be used in growing forest trees should be prepared the same as for a corn crop.

Classes of trees easily propagated by cuttings are the Cottonwood and Willow; by seeds, Ash, Maple, Walnut, and Box Elder. Ash and Box Elder must be gathered in Autumn, packed in moist sand until spring, and sown as early as any danger of frost has passed. Gather Soft Maple seed as soon as ripe, in spring. Walnuts can be safely planted in the fall, or bedded out to freeze during winter, and planted early in spring, in rows, where they are to form groves or timber lots. Cuttings should be made in the fall, and packed in sand or trenched in the ground the same as is customary with hedge plants, and planted in nursery rows about four feet apart, in the spring.

In forming timber lots, plant the trees in rows four feet apart each way, and thin out as they enlarge so as to interfere. Culture each year, until the trees shade the land sufficiently to smother out weed growth, should be the same as required for a corn crop.

Timber-belts are decidedly beneficial to garden and field crops.

The oldest successfully-grown timber lot is now thirteen years of age, and composed of Soft Maple and Black Walnut. The average diameter ranges from six to eight inches, owing to the variety, and twenty-five feet in height.

There is sufficient evidence that timber growing can be made profitable in this county.

RENO COUNTY.—BY A. S. DIMOCK, HUTCHINSON.

The following classes of forest trees have been successfully planted and grown in this county, and are listed in the order of their success: Cottonwood, Box Elder, White Ash, Catalpa, Black Walnut, Elm, and Gray Willow. Those valuable for timber are Catalpa, Ash, Elm, Box Elder, Black Walnut, Cottonwood, Osage Orange; for shelter-belts, Gray Willow, Cottonwood, Box Elder.

Classes preferable for lowland planting, Cottonwood, Elm, and Willows; for upland, White Ash, Box Elder, Catalpa, Osage Orange, Honey Locust.

Land for forest trees requires thorough preparation before planted, by deep plowing and harrowing.

Classes easily propagated by cuttings are Cottonwood and Willows; by seed, White Ash, Box Elder, Elm, Walnut.

Gather seeds of Box Elder in Autumn, and pack in sand until spring—Ash, whenever ripe, and store in a cool, dry place. Walnuts, gather and plant in fall. The best results with cuttings are obtained by making them in early spring, and plant at once where they are to form permanent trees; cut them ten to fourteen inches long, and set so as to leave only one bud above ground. Box Elder seed should be planted as early in spring as the land can be properly prepared, covering about one inch deep. Ash seed, sow in spring; they require soaking twenty-four hours before planted. Black Walnut are most successful when planted for a permanent stand; cover these about three inches deep.

In planting a timber lot or grove, set the trees in rows eight feet apart, and four feet in rows; cultivate each year as often as is necessary to subdue weed growth and keep the land mellow, until the growth in the rows renders it impracticable to continue. Culture should cease each year by the 20th of July.

Timber-belts planted on the south side of growing crops have been a decided advantage.

The oldest timber lot or grove successfully grown in this county is now nine years of age. It was planted on sandy upland soil, and composed of Cottonwood. The average diameter of these trees is nine inches, and height twenty five feet.

Timber growing can be made profitable in this county, by the protection afforded to crops and stock, and for fuel.

BY B. P. HANAN, LANGDON.

Of forest trees, the following have been successfully planted and grown in this county, and are listed in the order of success: Box Elder, Cottonwood, Black Walnut, Ash, Honey Locust, Catalpa, Osage Orange, Russian Mulberry, and Red Cedar. Those valuable for timber, in the order following: White Ash, Green Ash, Black Walnut, Osage Orange, Catalpa, Russian Mulberry, Honey Locust, Box Elder, and Red Cedar; for shelter-belts, Red Cedar, Russian Mulberry, and Cottonwood.

Varieties preferable to plant on lowlands, Ash, Cottonwood, Box Elder, Soft Maple, Walnut, Willow, and Catalpa; on uplands, Red Cedar, Honey Locust, Osage Orange, Russian Mulberry, and Ash.

Land for forest-tree planting needs to be deeply and thoroughly stirred. New land should not be used until the sod is fully rotted.

Propagation: All the Poplar family, Willows and Mulberry propagate easily by cuttings; the Ash, Box Elder, Catalpa, Locust, Maples, Osage Orange and Walnut require propagation by seeds. Cuttings do best when made in autumn and buried in moist but well-drained earth until spring, and then planted, yet they may be made any time before the leaves start in spring, with fair success. Seeds of Ash, Box Elder, Walnut and Locust do best when buried in moist, well-drained earth in autumn, formed into beds and covered just enough to prevent their drying. The oftener they freeze and thaw, the better the success. Locust seed may be treated successfully by scalding in hot water just before planted. Elm and Soft Maple must be planted soon after the seed ripen in spring, and before they become dried. Catalpa may be planted without any preparation, at the usual time for corn. Soak Osage Orange seed in water until they begin to show sprouting; placed in a sack and sunk in a running stream is best. Walnuts, Honey Locust and other large seeds had better be planted in autumn, and where they are to be grown into permanent trees. Such seeds as the Ash and Box Elder, plant early in spring, in nursery rows, ten or twelve seeds to a foot; Soft Maple and Catalpa, in May and June.

In forming timber lots, set the trees in rows four feet apart each way, and thin out as the branches interfere. Thick planting causes them to grow tall and make nicer trees. They may be set in rows ten or twelve feet apart, and grow corn between, which will produce the same result. Trees should be cultivated often until the last of July each year, and when necessary to keep weeds out of the rows, use a hoe. In this section, where sand prevails and is liable to drift, cultivate so as to leave the surface of the ground rough, as it will prevent to some extent the liability to drifting. Cultivation will be necessary each year until the trees are sufficiently large to entirely smother out all weed growth.

Timber-belts are considered by our best farmers a great benefit to all crops, in which I fully concur. They will, when properly constructed, prevent largely the disastrous effects of the drifting sand so common in open grounds.

The oldest successfully-grown timber lot that I have any knowledge of, is the experimental grove of the A. T. & S. F. R. R. Co., a short distance west of Hutchinson. Here the first planting was made in the spring of 1873, and larger planting in 1874 and 1875. These include the Cottonwood, Box Elder, Black Walnut, Green Ash, Honey Locust, Silver Maple, Catalpa, Ailantus, and Kansas Willow, and were planted on bottom lands. Cannot now furnish the diameter and height of these trees.

RICE COUNTY.—BY DR. G. BOHRER, RAYMOND.

Of forest trees, the following classes have been successfully planted and grown in the county, and are listed in the order of success: On heavy upland, Box Elder, Ash and Black Walnut are preferable; on very sandy lowland, Cottonwood and Black Walnut. Those valuable for timber are—first, Box Elder; second, Walnut; third, Ash; fourth, Cottonwood. Valuable for shelter-belts, all of the last-named list, and in the order given.

Classes preferred for upland and lowland—first, Elm; second, Cottonwood; third, Box Elder.

For roadside tree-planting, the Box Elder is the most suitable, being of a dwarf habit.

In the preparation of land for forest trees, that which is sandy will require only one thorough plowing, and heavy land at least two plowings before planted.

Of forest trees, those that propagate easily by cuttings, are Cottonwood and Willows; by seed, Box Elder, Elm and Ash. Seeds of Box Elder and Ash should be gathered in the fall, just after a frost, and stored in a secure place against mice until spring; plant about the 1st of May, in rows about four feet apart, and cover one inch deep. Plant cuttings in rows, about the same as for Box Elder seed, and six to eight inches apart in the row.

In forming timber lots or groves, plant the trees in rows six to eight feet apart, and in the rows about three feet apart. Cultivate with double-shovel plow, and when necessary, use a hoe. Such culture as is required to produce a good corn crop each year will be suitable for forest trees until large enough to shade the land, then cease.

Timber-belts are a decided advantage to growing crops of any kind, by the protection they afford.

The oldest successfully-grown timber lots or groves in this county are now six years from the planting, are mostly on upland, and composed of Box Elder, Walnut, Ash, and Cottonwood. These will measure in diameter from two to six inches, and in height twelve to fifteen feet.

Timber growing can be made profitable for fuel and other purposes, and decidedly so for protection to growing crops.

BY REV. J. B. SCHLICHTER, STERLING.

List of varieties successfully planted and grown, named in the order of—first, their success: Walnut, Box Elder, Catalpa, Soft Maple, Black Locust, Honey Locust, Elm, Cottonwood, Red Cedar, Ailantus; second, for timber, Walnut, Catalpa, Black Locust, Ailantus, Box Elder, Red Cedar; third, for shelter-belts, Box Elder, Cottonwood, Black Locust, Honey Locust, Catalpa.

Preferable for lowlands, Cottonwood, Walnut, Elm, Soft Maple, Box Elder, Catalpa, Honey Locust; adapted to uplands, Black Locust, Ailantus, Catalpa, Box Elder, Honey Locust.

Preparation of the land before planting should be deep, using a subsoil stirring-plow; open trenches with plow where the row of trees is to stand, eight to ten inches deep, to catch the rains.

Propagation: Varieties easily grown from cuttings are the Cottonwood, Catalpa, Mulberry, and the Black Locust from root sections; by seed, the Walnut, Box Elder, Honey Locust, Elm, Soft Maple.

Preparation of seed: Walnut, bed out in the fall; prepare the beds, by throwing out the earth to a depth of six inches; then spread the nuts two or three inches deep, and cover with two to three inches of earth; keep them moist during winter by an occasional watering, if necessary. In the spring, as soon as they commence to sprout, take them up carefully, and set those sprouted where the tree is to grow. If they do not sprout in the bed, it is evidence that they were too dry when bedded, or that the bed has not been kept sufficiently wet. In that case, plant them close in the open furrow in plowing, and turn a furrow over them, as is done by plowing in seed potatoes; they may yet sprout and grow.

Cuttings should be made in winter or early spring. Cut the sections to about one foot in length; tie in bundles of fifty to one hundred, with butts one way, and bury in the ground, butt end down, until about the time for setting, which should be at the first swelling of buds on trees in spring; then place them butt end down in a tub or trough of water, to the depth of two or three inches, until they begin to sprout, when they must be planted immediately, in a moist soil, and if practicable, where the trees are to grow. Select a cloudy day for planting, and avoid all exposure to wind or sun. Plant four feet apart each way, or in rows eight feet apart, and two feet in the row. The cultivation should be thorough and constant, with a horse cultivator and hand hoe, each year, until the first of August; when the trees shade the land, the culture may safely cease.

Field and garden crops thrive better by having the south wind broken from them; but care must be given to prevent too dense a growth in a windbreak, as some ventilation is needed with all crops.

Investments in timber growing can be made profitable by close planting. At eight or ten years of age, large quantities of timber can be taken out from the lot that will make stakes, poles, posts, and fuel.

The age of the most successfully-grown timber in this county is now seven to eight years. The variety is Cottonwood, and located on what is termed second-bottom land. The average diameter of the trees is six inches, and height twenty-five to thirty feet.

RILEY COUNTY.—BY PROF. E. A. POPENOE, STATE AGRICULTURAL COLLEGE.

The classes of forest trees which have been successfully grown in this county are listed in the order of their success, as follows: Cottonwood, Walnut, Soft Maple, Box Elder, Catalpa, Green Ash, White Elm, Osage Orange, and Ailantus. Those valuable for timber, in the following order: Walnut, Osage Orange, Catalpa, Green Ash, Ailantus, White Elm, Box Elder, Cottonwood, and Soft Maple; valuable for shelter-belts, in the following order: Cottonwood, Soft Maple, Box Elder, Osage Orange.

Varieties preferable for lowland planting, Elm, Ash, Box Elder, Cottonwood, Soft Maple, Walnut, Catalpa, Honey Locust, and Kentucky Coffee-tree; all of these, with an addition of the Osage Orange and Ailantus, are adapted to upland planting.

Land designed to be planted with forest trees should be as thoroughly prepared as that for an orchard of fruit trees, but is generally of the character given for a crop of corn.

Such classes of forest trees as propagate easily by cuttings are the Willow and Poplar family; by seeds, Walnut, Catalpa, Ailantus, Elm, Ashes, Box Elder, Maples. Seeds of Mulberries, Elms, Maple and others that ripen in spring, should be planted at once, after gathered. Such as produce fleshy or pulpy outside covering should be first lightly bruised, to break the covering, and the seed then cleaned by washing, to facilitate sowing. Seeds of Ash, Ailantus, Box Elder and dry fruits, ripening in fall, it is best to pack in moist sand or earth until spring, and then plant. Thick-shell nuts should be bedded out and covered about two inches deep with earth, until planted in spring. Honey Locust and Kentucky Coffee-tree seeds require soaking a long time or scalding with hot water just before planted. Cuttings are best when made in winter and stored in damp material until spring. These may be cut just before planting in the spring, but are not generally quite as successful. As a general rule, plant seeds and cuttings as early in spring as the land can be properly prepared; plant in rows four feet apart, and one to two feet in the row. While such close planting may seem an unnecessary and wasteful method, it appears to be more successful than a greater distance, because of the mutual protection afforded. Hard-wood or slow-growing classes may be planted at greater distances than above stated, but the spaces should be planted with less-valuable stock, for protection, and to encourage erect growth. Closely-planted timber lots will require thinning out as the trees enlarge and growth interferes. Such treatment will be necessary in a few years after planting, to facilitate cultivation. Such varieties as form delicate plants, should be grown in seed-beds or nursery form the first year, as their care can be more easily and thoroughly effected.

The care necessary for timber groves and timber lots is what is commonly termed "good culture," as keeping all weeds subdued and the soil well stirred each year until the trees shade the ground.

Generally, timber belts have proven to be an advantage by their protection to field and garden crops. Exceptions to this are rare.

Timber growing is unquestionably profitable, when undertaken as a part of general farming, for home supply, where land is as cheap and timber scarce as in most portions of this State.

RUSH COUNTY.—BY BURR H. BUNN, RUSH CENTER.

The condition of forest trees planted in this county is good, considering the extreme dry weather in the spring of 1879 and 1880. The trees are too young to form any estimate of their value for timber purposes. Shelter-belts are indispensable where stock is kept.

Varieties preferable to plant on lowlands, are Cottonwood, Box Elder, and Walnut; on upland, Cottonwood.

Land intended for timber should be kept under cultivation from two to three years, and plowed deep before planted.

The Cottonwood is easily grown from cuttings; may be taken from the tree in early spring, and planted at once. Seeds of Box Elder, Walnut and Ash should be planted in autumn; Walnuts, where they are intended to form into permanent trees, and the others in shallow drills, four feet apart, to give facilities for thorough culture the first year: thin out, and transplant afterwards.

In forming timber lots, set in rows, twelve feet apart, and for shelter-belts four to six feet. Young trees should receive thorough cultivation during the fore part of the season.

The age of the oldest timber lots or groves in this county is from three to four years, planted on upland, and composed of Cottonwood, Box Elder, and Walnut. Their height ranges from six to fifteen feet, according to the variety.

RUSSELL COUNTY.—BY W. A. LEWIS, RUSSELL.

The following classes of forest trees have been successfully planted and grown in this county, and are listed in the order of their success: Ash, Box Elder, Black Walnut, Osage Orange, Soft Maple, Cottonwood, and Catalpa. Valuable for timber, Osage Orange, Ash, Black Walnut, Box Elder, Catalpa, Soft Maple and Cottonwood; for shelter-belts, Osage Orange, Black Walnut, Box Elder.

All of the foregoing classes are successful on the uplands. Have not had any experience with forest-tree culture on lowlands.

Land intended for forest trees should be thoroughly subdued by one or more years' cultivation by deep plowing and thorough pulverization.

The classes of trees most easily propagated by cuttings, are Cottonwood and Lombardy Poplar; all others should be propagated by seed. Plant Black Walnuts in fall, or pack in dampened earth or sand, and frozen; then plant in spring. Plant Box Elder and Ash in fall; no preparation is necessary.

Plant Soft Maple as soon as ripened, in the spring. Osage Orange seed require soaking in water until they begin to sprout, and plant at once. Cuttings are best made in the spring; pack on their ends in moist earth until the ground becomes warm, and set in rows four or five feet apart, and one foot in the rows. In forming wind-breaks, construct three or four rows, four or five feet apart, and set the trees from two to three feet in the rows.

For timber lots, plant in rows eight feet apart each way. All forest trees, whether planted in nursery or groves, should receive careful and thorough culture while young; with groves and timber lots, cultivation can safely cease as soon as the growth affords shade to the land sufficient to smother out weed growth.

The successfully-grown timber lots or groves in this county are now four years old, were planted on upland, and composed of Black Walnut, Box Elder, and Cottonwood, which average ten feet in height and nine inches in diameter.

(Note.—By request of this office, the following statement of experience in tree planting in Russell county was obtained by Mr. Lewis, and furnished for publication in this department.—Sec'y.)

TREE PLANTING IN RUSSELL COUNTY.—BY W. M. PENNELL, RUSSELL.

As per your request that I should write up my experience as to what I know about tree planting in Kansas, I will jot down an item or two.

I, like other people who live in Kansas, am blessed (or you may substitute the other word, if it will make the statement any more emphatic) with a Kansan's inclination to make out a good story when speaking of the resources and natural advantages of each particular quarter-section of this much-talked-about State. But the truth only half told in this case would record many very successful failures. On November 20th, 1875, I planted on my place, west of town, eight bushels of unhulled walnuts, on six acres of poorly-cultivated ground, the ground being marked off in deep furrows, east and west, eight feet apart, dropping the walnuts two feet apart in the rows, covering with plow to the depth of six inches (which was two inches too deep). About one-half came up in July and August, and those not destroyed by gophers, or what was worse, the careless manner with the plow, came up one year after planting. In the spring of 1876 I made a united centennial effort, in which I transplanted 3,500 one-year-old Cottonwoods, planted a hedge of Osage around the whole place, put out 10,000 Cottonwood cuttings, and in May I planted two bushels of Cottonwood seeds. Owing to a protracted drouth in June, and poor cultivation, I lost the whole spring's planting.

In the spring of 1877 I planted Cottonwood and Maple seeds, which failed to grow. Two thousand five hundred one-year-old Lombardy Poplars grew for a time, but perished during the summer. The above will give you an idea of my operations, and I am sure will be sufficient proof that my failures have been most complete.

Last spring it was my good fortune to employ an honest man, who did my work in an honest way, and asked for no pay until the work was properly done. Out of 2,500 Catalpas transplanted during the dry, hot spell in May, I think not more than six failed to grow.

And now to sum up: To make a success of tree planting, never pay for the work in advance. Such a course would kill even a Kansas sunflower. The ground should be cultivated thoroughly for at least two years. If you want Walnuts, put them where you want them to grow; all other seeds should be planted in nursery rows, cultivated one year, and then transplanted. I would cut every tree back when planting to eighteen inches, otherwise the wind gets leverage sufficient to form an opening in the soil, through which the hot air reaches the roots and kills the tree. I think fall planting much better than spring. Ordinarily eight feet apart, giving room for a row of corn between the trees, is the proper distance. The growing of corn among them gives some protection to the timber, besides offering a slight inducement to keep the ground clean for the corn you may get. I have growing in all about 7,000 trees, mostly Walnuts and Catalpa, a few Box Elder and Ash. There are some Oaks on the place, but I cannot class them among the growing trees, as they are five years old, and not five inches high.

I look upon the Cottonwood as a failure, even if you are successful growing it. Those on my place are denuded of their foliage every year. I give my preference to the following trees for high-land planting in central Kansas: Black Walnut, Catalpa, Box Elder, White Ash; and as a wind-break, making a quick, vigorous growth, I am convinced that the Black Locust will prove a valuable tree for this section.

I am not one of the oldest inhabitants of this country, having only been here seven years, but during this time observation and experience have taught me some things, and the more I see of this high-land section of Kansas, and the conditions which surround us, the more thoroughly am I convinced that until our people mount this "hobby" of mine, and plant trees sufficient to break up the high, hot winds which sweep over this country, agriculture will prove a failure, and the failures and sad experience of the past and present must be faced in the future.

SALINE COUNTY.—BY H. A. NORTHROP, SALINA.

The following classes of forest trees have been successfully planted and grown in this county, and are listed in the order of their success: Cottonwood, Box Elder, Black Walnut, White Ash, Black Locust, and Honey Locust. Most valuable for timber, are Black Walnut and Locust; for shelter-belts, Box Elder is the best, and Cottonwood the hardiest.

Varieties adapted to lowlands: Black Walnut, Cottonwood, Locust, and Ash; for uplands, Box Elder, Black Walnut, Locust, and Cottonwood.

Land selected for forest trees, should be well subdued by cultivation before planted; plow deep in the fall, replow the following spring, and thoroughly pulverize.

Propagation: The Cottonwood is the only variety that succeeds easily by cuttings; by seed, Black Walnut, Box Elder, Ash, and Locust. Cuttings should be made of the last year's growth, in the fall or mild weather in winter, about ten inches in length; bury in the ground below frost, and plant in the spring about the middle of April. Of seeds, gather Black Walnuts in the fall; bed them on a smooth surface of ground, and cover with sand; keep them moist all winter, and plant the last of March, in rows, where they are to form permanent trees. Box Elder and Ash, gather in the fall, and keep dry until spring; then pour hot water over them, let them soak twenty-four hours, and plant and cover one inch deep; or these may be mixed with moist sand, and frozen, just before planted. Treat Locust seed the same as recommended for Box Elder. In planting cuttings, open a deep furrow, stand them against the land-side at proper distances apart, six to eight inches apart, with a hoe draw around them fine soil; follow with a double-shovel plow, fill up the furrow, and tramp the ground firmly around the cuttings, and mulch.

In forming timber-belts or lots, set the trees in rows, four feet apart and four feet in the rows; plant every third or fourth row of Black Walnut; and as the growth requires more space, remove all other classes which may have been used in the formation of the grove, which would leave the entire land in possession of the Walnut. Cultivation the first year will need to be careful, as the plants will be small. Frequent hoeing will be required during the fore part of the season, especially to remove weeds from rows. After that, cultivation can be done with a double-shovel or cultivator, or mulch the entire ground sufficiently deep to keep all weeds subdued. In such treatment, great care must be given to prevent fires reaching the mulch. Cultivation may safely cease at any time when the trees will shade the land.

Timber-belts are no benefit to field crops, but located on the south, north and west of a garden, are an advantage, by checking the violent winds in spring and causing the snows to lodge in winter.

The oldest grove was planted in 1866, but it is not the largest in growth. Many of those planted in 1867 and 1868, one rod apart, are now fourteen to sixteen inches in diameter, and forty to fifty feet in height; are on lowland.

Timber growing can be made profitable. One farmer has a lot of six acres, now six to eight years old. This furnishes him all the fuel needed. Others have demonstrated the profitableness of timber growth.

SEDGWICK COUNTY.—BY WM. MCCRACKEN, SUNNY DALE.

Of forest trees, the following classes have been successfully planted and grown in the county, and succeed in the order named: Cottonwood, Black Locust, White Willow, Box Elder, and Catalpa. Classes valuable for timber are Black Locust, Black Walnut, Cottonwood, White Ash, Catalpa; for shelter-belts, White Willow, Cottonwood, and Soft Maple.

Adapted to lowlands, Cottonwood, Soft Maple, Willow, White Ash, Catalpa, Locust, Elm; to uplands, Black Walnut, Black Locust, White Ash, Box Elder, Honey Locust, and Cottonwood.

Land selected for forest trees should be prepared before planted, in same manner as required for a crop of corn.

Of the classes of forest trees easily propagated by cuttings, are the Willow, Cottonwood, Silver Maple, Lombardy Poplar, and Catalpa; by seed, Black and White Walnut, Locust, Maple, Elm, Buttonwood*, Box Elder, and Catalpa. Cuttings should be made late in autumn, about one foot in length, and buried in the ground until spring; plant in April. Black and White Walnut, gather in fall, and plant where they are to form groves or timber lots before they become dried. Black Locust, gather in autumn, store until spring, and then pour on to them boiling-hot water, and plant, covering lightly. Soft Maple and Elm, gather when ripened, and plant at once. Box Elder and Catalpa, gather in autumn, and plant in spring. Buttonwood, sow in fall. All small seeds do better planted and cultivated in nursery form for one or two years, and closely cultivated.

In forming timber lots, plant slow growers in rows four feet by six; rapid growers, four feet by eight—and thin out in after years as they crowd each other. The cultivation of such as are planted in nursery form should be as required for a vegetable garden; of timber lots and groves, or shelter-belts, the same as for a corn crop, each year, until the growth of the trees shades the entire land.

Timber-belts, properly arranged, afford a beneficial protection to field and garden crops around which they are planted.

The age of the oldest successfully-grown timber lot or grove in the county is now ten years; was planted on lowland, and composed of the Cottonwood. The average diameter of these trees is twelve inches, and the height fifty feet.

Timber growing can be made a profitable investment in this county.

SHAWNEE COUNTY.—BY THOS. BUCKMAN, TOPEKA.

The Black Walnut, Cottonwood, Soft Maple and Catalpa are the most successfully-grown varieties of forest trees planted in this county, and succeed in the order named. Those valuable for timber are the Black Walnut, Catalpa, Soft Maple, and Cottonwood; for shelter-belts, the Soft Maple and Cottonwood are preferable.

The Black Walnut, Honey Locust, Red Elm and White Ash are best adapted to our lowlands; for uplands, the Soft Maple, Cottonwood, Catalpa and Osage Orange are preferable.

Any land selected for forest trees must be deeply plowed in autumn, and replowed and thoroughly pulverized in the spring before planted.

Propagated easily by cuttings are the Cottonwood, Lombardy Poplar, and White Willow; by seeds, Walnut, Maple, Locust, Elm, Kentucky Coffee-tree, Ash, Catalpa. All fall-ripening seed should be gathered as soon as ripe, packed in a box of moist sand, and placed where they will freeze in winter; or may be bedded in the ground, covered about two inches deep, and kept moist. Cuttings should be made about ten inches in length just before time for planting in spring; select the previous year's wood growth for such purposes; plant as soon as ready, leaving only the top bud above ground; tramp the earth down around them.

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*Sycamore is the common name for Buttonwood.

Seeds: Cover Walnuts and Kentucky Coffee-tree three inches deep; Locust, two inches; Elm, one inch; Soft Maple, which ripens in May, must be sown at once; cover these one inch.

In forming timber lots, set the trees in rows sixteen feet apart, and four feet in the row, and thin out as the growth requires. Cultivate all forest trees often and thoroughly, whether in the nursery, timber lot, or grove. Corn may be grown between the rows of a timber lot to an advantage.

In forming a timber-belt, plant the trees in rows six feet apart, and four feet in the rows. Cultivation can safely cease as soon as the size and growth of trees is sufficient to shade and smother out all weed growth.

The age of the oldest timber lot or grove successfully grown in the county is now thirteen or fourteen years from the planting; was set on upland, and composed of Black Walnut, Ash, Soft Maple, Sweet or Black Birch, Chestnut, Linden, and Elm. Most of these trees will measure six inches in diameter, and from twenty-five to thirty feet in height.

Timber growing can be made profitable in this county. There are many nooks along the streams of our bottom land that could be planted to Walnut with great profit, and will not interfere with the farming land.

SUMNER COUNTY.—BY H. C. ST. CLAIR, BELLE PLAINE.

Of the classes of forest trees the following have been successfully planted in this county, and succeed in the order named: Black Walnut, Soft Maple, Elm, Box Elder, and Cottonwood. Those valuable for timber, Walnut, Box Elder, and Cottonwood; for shelter-belts, Cottonwood.

All the foregoing classes succeed on lowlands; on uplands, Walnut, and Elm. Insects destroy the others when planted on uplands.

Lands selected for forest trees should be broken up and cultivated at least two years before planted.

Varieties of forest trees easily propagated by cuttings, are the Cottonwood and Poplar; by seeds, Box Elder, Elm, Maple, Ailantus, and Walnut. Seeds of Box Elder and Ailantus should be gathered as soon as ripe, and planted in nursery rows in the fall. Transplant when one year old. Elm and Soft Maple ripen in spring and summer, and must be sown at once. The young seedling Elms need shade the first summer. Walnuts should be spread out on the ground in fall, covered with earth two inches deep, and allowed to freeze during winter. Plant the following spring, and where they are to form permanent trees. Cuttings may be taken from the tree in spring, and planted at once where they are to stand.

In forming timber lots, plant in rows four feet by sixteen, and thin out every other tree in the thickest rows, as they become large enough for any use. Cultivation during the first four years should be the same as required for corn. Either corn or potatoes, or both, can be grown among the trees to an advantage. After the fourth year sow to rye, and hoe around the trees for three years, then sow to tame grass. (NOTE.— Black Walnuts do much better when grown one year from seed, to cut them down to the ground and allow only one shoot to grow from the stump. Thus treated, they form into a much straighter, stronger body.)

Timber wind-breaks located on the south side, afford a beneficial protection to field, garden and orchard crops.

The age of the oldest timber grove in this county is eight years, was planted partly on bottom or valley, and extends into table land, and is composed of Cottonwood, Walnut, Maple, Elm, Ailantus, and Poplar. The average diameter and height of these are as follows: Cottonwood, diameter 9 inches, height 30 feet; Walnut, diameter 4 inches, height 15 feet; Maple, diameter 4 inches, height 15 feet; Elm, diameter 4 inches, height 15 feet; Ailantus, diameter 6 inches, height 20 feet; Poplar, diameter 6 inches, height 25 feet.

Timber growing can be made a profitable investment. My first planting is now eight years old, affords me posts and poles for their various uses on a farm, and considerable fuel. I would not be without it for $50 per acre.

BY A. S. CLARK, MILAN.

Of forest trees, the Cottonwood, Box Elder and Willow have been successfully planted and grown in this county, and succeed in the order named. Those valuable for timber, the Willow; for shelter-belts, Cottonwood.

Preferable to plant on lowland, Willow, Cottonwood, and Black Walnut; on upland, all of the above, excepting the Willow.

The preparation of land selected for forest trees should be the same as required for a first-class crop of corn.

The Willow and Cottonwood have been easily grown from cuttings; the Black Walnut and Box Elder from seed.

The oldest successfully-grown timber lot in this county is now three years from setting; was planted on lowland, and with the Cottonwood. These trees will now average in height fifteen feet, and three inches in diameter.

WALLACE COUNTY.—BY VAN SMITH, GRINNELL.

But little has been done in this county in the direction of tree planting. From the evidence, we conclude that the Cottonwood and Box Elder will succeed on lowlands, and White Ash, Walnut and Soft Maple on the uplands.

Land selected for forest trees should be well plowed, harrowed, and rolled before planted.

After trees are set, it is very desirable that the ground should be surface-dressed with fine manure. I tried planting White Ash seed. The first and second efforts were failures. Seed used were dry, and received no preparation. The third time I soaked the seed in water ten days, and where they were exposed to the sun, the hull became rotten. Planted about the 1st of July, 1880. The third day after, the young plants began to appear, and by the 1st of November they had made a growth of five inches, and are all right now, (March, 1881.)

In forming timber lots, I would advise planting trees in rows, six feet apart and three feet in rows. Cultivate each year, until the ground is shaded by their growth.

In my opinion, timber-belts as a protection to field and garden crops are a decided benefit, and if every forty acres of a quarter-section of land was surrounded with only four rows of timber trees, it would enhance its value one hundred per cent.

Timber culture in the western counties is a matter of the greatest importance, and needs the support of our State and the National Government.

WABAUNSEE COUNTY—BY ABNER ALLEN, WABAUNSEE.

The following classes of forest trees have been successfully planted and grown in this county, and in the order named: Cottonwood, Box Elder, Black Walnut, Soft Maple, and Red Elm. Those valuable for timber, Black Walnut, Cottonwood, Box Elder, White Ash; for shelter-belts, the entire list first named, alternating the rows with Red Cedar.

All classes are equally adapted to either upland or lowlands.

Land selected for forest trees requires thorough preparation before planted.

Varieties of trees easily propagated by cuttings are the Cottonwood and Willow. All other classes are more successfully propagated by seeds. Black Walnut, Oak and Hickory seeds should be planted in fall, or buried in moist earth until spring, and planted early. They should not be allowed to dry, as their germination is seriously injured thereby. Other forest-tree seeds may be planted as soon as ripened, and require no special preparation. Red Cedar seed require to be soaked in strong lye until it dissolves their resinous coating, before planted. Plant seeds of Elm, Box Elder and Maple, in shallow drills, as soon as possible after they ripen, and cover lightly. Cottonwood seed should not be covered, but simply pressed into the surface of the ground. Cuttings are best when prepared in the fall. They may be buried in the ground below frost during winter, and planted very early in spring.

In forming timber groves, set the trees in rows eight to ten feet apart, and one to two feet in the rows. Cultivation should be thorough the first and second years, but not later than July 1st; then grow oats among them, to check growth and mature the wood for winter. Pursue this method until the growth of the trees is sufficient to shade the land.

Field and garden crops thrive much better when protected by timber-belts, but care must be given that they are not set out too close to the ground occupied with farm crops.

The oldest successful timber groves in this county are from eighteen to twenty-four years, from planting; were planted mostly on lowlands, and composed of Cottonwood, Black Walnut, Box Elder, and Soft Maple. The average diameter and height of these trees is as follows: Cottonwood, fourteen years old, six inches in diameter, sixty feet in height; Box Elder, twenty years old, eight inches in diameter, seventy feet in height; Black Walnut, fifteen years old, five inches in diameter, forty feet in height.

Here is sufficient evidence to convince anyone that timber can be grown successfully, and unquestionably with profit, in this county.

BY H. A. STILES, PAVILION.

The following list of forest trees have been successfully grown in this county, and succeed in the order named: Cottonwood, Black Walnut, Box Elder, Red and White Elm, Red Cedar, Honey Locust, Ash, and Catalpa. Those valuable for timber are Black Walnut, Kentucky Coffee-tree, Honey Locust, Catalpa, Red Elm, Box Elder, Mulberry, Ash, White Elm, and Red Cedar; for shelter-belts, Cottonwood, Red Cedar, Red and White Elm, Box Elder, and Mulberry.

Classes preferable for lowland planting, Cottonwood, Box Elder, Red and White Elm, Mulberry, Kentucky Coffee-tree, Catalpa, Hackberry, and Ash; for upland, Black Walnut, Oak, Catalpa, and Honey Locust.

Land selected for forest trees, if sod, should be broken up in May or June, and plowed very deep, late in fall, and planted early next spring.

Propagation by cuttings: The Cottonwood and Willows are easily grown from cuttings; by seed, Black Walnut, Elm, Oaks, Hickory, Mulberry, Hackberry, and Box Elder.

Preparation and planting: All the nut and hard-shell seed are most successful when bedded in the ground in the fall, covered about two inches deep, and kept moist; plant early in the spring, covering them two to three inches deep. This treatment applies to most of other classes of forest-tree seed. Seeds planted in nursery form should be sown in rows, four feet apart and twelve to fourteen inches in the rows. The nut classes should be covered when planted two or three inches deep; smaller seeds require less.

Plant cuttings in furrows, slanting them to the south; cover them partly, and tramp the earth down; finish by turning the earth against them with a plow, leaving only an inch or two above the covering. Cuttings should be made from the last year's growth and of wood from thrifty trees, in the fall; cut them about nine or ten inches in length, tie in bundles of fifty each, bury in trenches, with the top end down, and cover with four inches of mellow soil and enough of horse manure to protect from frost until planting-time in spring. This treatment will cause the ends to callous or heal over, which is important to success. Cuttings should be planted early in the spring.

In forming timber lots, set the trees in rows, six feet apart and four feet in the rows. Cultivation the first and second year should be thorough, to keep down weeds. Keep up good cultivation each year thereafter until the trees are at least six years old, trimming off all straggling limbs which may interfere, in the spring.

Timber-belts are almost indispensable to successful gardening, and very useful to field crops, and especially to orchards.

The oldest timber lot successfully grown in this county is about nine years, from planting; was planted on river bottom, and composed of Cottonwood. The diameter of these trees ranges from six to twelve inches, and the height from thirty to fifty feet.

Timber culture can be made profitable in this county.

WASHINGTON COUNTY.—BY DR. CHAS. WILLIAMSON, WASHINGTON.

The following classes of forest trees have been successfully grown in this county, and are named in the order of success: Cottonwood, Box Elder, and Walnut. Those valuable for timber are Black Walnut, Cottonwood and Box Elder, all of which are suitable to plant for shelter-belts.

Varieties preferable for planting on lowlands: Cottonwood, White Willow, Black Walnut, and Box Elder; on uplands, all of the above, to which we might safely add, the Honey Locust, White Ash, and White Mulberry.

Land selected for timber lots should be thoroughly and deeply plowed before planted.

Classes of trees that are easily propagated by cuttings, are the Cottonwood, Poplar, Catalpa, White and Red Mulberry, and Willow; by seed, the nut-bearing classes, Ash, Box Elder, and Elm. All cuttings should be made in the fall and from the last year's growth, tied in bundles of fifty each, buried in the ground below the reach of frost, to cause the bottom end to callous in time for planting in spring. Seeds of the Ailantus should be planted in spring, also the Box Elder. All seeds like the Honey Locust, having a hard shell, should have scalding water poured on to them two or three times before planting. This treatment hastens germination, and affords better results. All forest seeds and cuttings should be planted in their permanent location, and especially those having hard shells.

In forming timber lots, set the trees in rows six to eight feet apart, and for shelter-belts four by eight feet. The cultivation should be thorough each year until trees are of sufficient size and age to shade the land, which with the Cottonwood and Poplar, would be at two or three years, but the Walnut and such classes will require from three to five year's growth.

Timber-belts afford a most beneficial protection to field and garden crops. (The hardy Mountain Currant will form an excellent shelter-belt for gardens.)

The age of the oldest successfully-grown timber grove in the county is now seven years from planting, was planted on upland, and composed of Cottonwood and Maple. The average diameter of these trees is six inches, and height twenty feet.

Timber growing for fuel and many other purposes can be made a profitable investment in this county.

WOODSON COUNTY.—By W. W. Smith, Neosho Falls.

The following classes of forest trees have been successfully planted and grown in this county—are here listed in the order of their success: Soft Maple, Ailantus, Black Walnut, and Cottonwood. Those valuable for timber, Black Walnut; for shelter-belts, Soft Maple, and Cottonwood.

Varieties preferable for lowlands, Black Walnut, Soft Maple, and Cottontonwood; for upland, Ailantus, Soft Maple, and Black Walnut.

The Cottonwood grows finely for a few years, when it is usually attacked by borers, after which its growth is slow. It sometimes dies from the attacks of borers.

The Maple some years is defoliated by caterpillars, and consequently makes a poor growth that season. It has been planted extensively, owing to the ease of procuring seed, and its rapid growth.

The Ailantus has, comparatively speaking, been introduced only a few years, and has not been extensively planted, but from those growing the past seven years, I can say that it is a rapid grower, and no insects have been known to infest it. It propagates easily, and forms a straight tree, with few limbs. Authorities say its wood is durable. On this point I cannot give any assurance. It will endure a drouth, and thrive on a sandy, dry soil, where other varieties will not. If it should prove to be a durable wood, with its other good qualities, it will be the most desirable tree for timber that can be grown.

For an easily and quickly-grown fuel, of an excellent quality, no class can excel the Peach tree. Of this I planted one-half an acre, in rows four feet apart, and one foot in the rows. At three or four years of age the lot afforded plenty of fuel. Our western settlers cannot plant a more desirable tree for a quick production of fuel than the Peach. It will renew its growth after each cutting, and form almost a perpetual wood lot.

Land selected for forest trees requires a thorough and deep preparation, by plowing and pulverizing, and if the soil is not sufficiently fertile to produce a good crop of corn, enrich it with well-rotted stable manure.

Propagation: The Cottonwood propagates easily by cuttings of the limbs, and Ailantus by sections of the roots; the other classes by seeds. Maples ripen the seed in May, and should be planted as soon as they drop from the trees. Ailantus ripens in the fall; may be gathered and stored in a dry place until spring. Black Walnuts, plant in the fall, bed out in the ground, cover lightly, and allow them to freeze during winter. Cottonwood seeds ripen in spring, and require planting at once. Plant Ailantus seed in spring, as soon as danger of frost is past; cover one inch deep. Cottonwood, cover lightly. Plant Black Walnuts in spring, as early as possible; cover two to three inches deep. Plant cuttings early in spring, in a slanting position; pack the soil firmly about them.

In forming timber lots, plant trees in rows six feet apart and from two to six feet in the rows. Cultivation should be such as is given to a crop of corn. Keep all weed-growth down and the ground mellow. When rows are six feet apart, a row of potatoes or beans can be grown. Cultivation can safely cease with Maples, Ailantus and Cottonwood at the end of the fifth year, and Walnut the seventh year.

Field and garden crops thrive better when protected by timber-belts.

The age of the oldest timber grove successfully planted in this county is fifteen years, was planted on second-bottom land, and composed of Soft Maples. The average diameter of the trees is six inches, and height twenty-five feet.

COUNTY REPORTS, 1880.

These reports have been compiled from answers to the following circular:

[CIRCULAR NO. 1.]

SECRETARY'S OFFICE, KANSAS STATE HORTICULTURAL SOCIETY,
LAWRENCE, January 20, 1881.

DEAR SIR: It affords me pleasure to herein tender you the appointment by the President of this Society, to the office of Vice President for your county. I trust that your interest in the successful development of horticulture in your county and the State will induce an acceptance and faithful discharge of the duties defined in the following article of the constitution:

> "ARTICLE VII. There shall be a Vice President annually appointed in each county in the State, whose duty it shall be to organize local horticultural societies in their respective counties whenever practicable, to report to each annual meeting on the general subject of horticulture, and to look after the interests of horticulture in their respective localities."

Article III of the constitution was amended at the thirteenth annual meeting, as follows:

> "Any person who, under the appointment of the President, shall perform the duties of a county Vice President for one year, shall be enrolled an annual member for that year, and, in consideration of such service for ten years, shall be enrolled a life member, and entitled to all the privileges of such membership."

The following questions are offered for the purpose of reaching SUCH FACTS AS HAVE BEEN DETERMINED FROM THE PAST EXPERIENCES in your county, and which must be observed in the future by persons entering upon the pursuit of horticulture, to secure satisfactory results. The Society desires to make this report for your county as complete a guide to practical work as intelligent observations and experiments will warrant; therefore, any information of a valuable character other than that suggested by these questions should be made a part of your report, and will be thankfully accepted by the Society.

ORCHARDS.

Date of first planting: Apple, pear, peach, plum, cherry. By whom? Post-office address.

Date of first fruiting: Apple, pear, peach, plum, cherry. On whose grounds? Post-office address.

What facts have been determined by the experiences of the past years, as to the most desirable location for the following varieties of trees? Apple, pear, peach, plum, cherry.

What soil is the most productive? Apple, pear, peach, plum, cherry.

What preparation of the soil is necessary? Apple, pear, peach, plum, cherry.

What season of the year is preferable for planting? Apple, pear, peach, plum, cherry.

What is the preferred method for planting, distances of trees, etc.? Apple, pear, peach, plum, cherry.

What the preferred system of cultivation, and time for such work? Apple, pear, peach, plum, cherry.

What the proper time and system for pruning? Apple, pear, peach, plum, cherry.

Have wind-breaks proven an advantage to your orchards and gardens?

If so, what varieties of trees have been successfully used?

Where located as to the orchard and garden?

How constructed? If in rows, what distances for the rows, and in the rows, should the trees be planted?

What your treatment of wind-breaks after planted?

Give a list of varieties, in the order of their value, which have been productive in your county for family purposes? Apple, pear, peach, plum, cherry; for market purposes: Apple, pear, peach, plum, cherry.

In an orchard of 100 trees, for family use, what varieties are to be preferred, and what number of each should be planted? Summer, autumn, winter.

In an orchard of 1,000 trees, for market purposes, what varieties are most reliable, and what number of each should be planted? (Named in the order of profit.)

SMALL FRUITS.

Date of first planting: Blackberry, currant, gooseberry, raspberry, strawberry. By whom? Post-office address.

What location is preferable? Blackberry, currant, gooseberry, raspberry, strawberry.

What soil is the most productive? Blackberry, currant, gooseberry, raspberry, strawberry.

What preparation of soil is necessary? Blackberry, currant, gooseberry, raspberry, strawberry.

What is the preferred time for planting? Blackberry, currant, gooseberry, raspberry, strawberry.

What system is preferred for planting? Blackberry, currant, gooseberry, raspberry, and strawberry.

What cultivation is necessary? Blackberry, currant, gooseberry, raspberry, and strawberry.

What pruning of the blackberry, currant, gooseberry, and raspberry?

Give a list of varieties established as reliably productive in your county, in the order of value: Blackberry, currant, gooseberry, raspberry, and strawberry.

What one variety affords the most satisfactory results in plant and productiveness? Blackberry, currant, gooseberry, raspberry, and strawberry.

Has mulching been an advantage to small fruits? In winter. In summer.

Is it profitable to manure any of the small fruits? If so, which classes? At what season should it be done? In what manner should it be applied? What amount to the acre?

VINEYARDS.

Date of first planting: By whom? Post-office address.

What character of location has been determined, by the experiences of the past, as most desirable?

What soil has proved the most productive?

What preparation of the soil is necessary?

What the preferred manner of planting, distance of plants, etc.?

What age of plants is the most suitable to use?

What cultivation is necessary, and the time for such work?

What system of training and pruning has been most successful?

Give a list of preferred varieties, in the order of success. For family use; for market.

MISCELLANEOUS.

What was the extent of planting in 1880 compared with that for 1879? Apple, pear, peach, plum, cherry, blackberry, currant, gooseberry, raspberry, and strawberry.

What is the present condition of the investments in the horticultural industry in your county?

Are the results of the past years satisfactory enough to warrant an extended investment in the future?

Is there a general interest and confidence in the pursuit with the people of your county?

ALLEN COUNTY.

(Northern half.)

BY H. E. VAN DEMAN, GENEVA.

ORCHARDS.

Date of first planting: All classes except plums, in 1855, by a Mr. Ross, who is not now a resident.

Location preferable: Apple, elevated lands; pear and peach, well-drained upland; plum and cherry, immaterial.

Soil most productive: Such as will produce a good corn crop.

Preparation: Thorough and deep fall plowing.

Planting season: Spring, for all classes.

Method and distances: Apple—Open deep furrows where the rows are to be planted, check these furrows with a plow, coat the roots with mud, and plant immediately; incline the tree to the southwest, and firmly pack the earth among the roots. Set in rows, 2 rods apart each way, and alternate with early-bearing varieties, as the Missouri Pippin and Winesap, or peach. These should be cut out as soon as they interfere with the permanent trees. Pear—Set in same manner as the apple, excepting the distance—standards 20 feet apart each way, and dwarfs 10 feet. Peach—Before planting, remove all side limbs, and cut back the stalk to two feet high; this prevents evaporation. Mud the roots, and plant as for the apple, in rows one rod apart. Plum—Set one rod apart, in rows. Treat same as the peach, excepting with less pruning at time of planting. Cherry—Treat same as the apple, and set one rod apart.

Cultivation: Use a horse cultivator during May, June, and July. Corn is the best kind of a crop to be grown in an orchard. The required culture to produce a good crop is the most suitable for trees.

Pruning: Season, in midsummer. Remove all limbs liable to interfere, maintain a center stem, and train the limbs to radiate at proper intervals along its entire length.

Wind-breaks, located on the south and southwest, not too densely formed, are an advantage to the orchard and garden. Should be constructed in rows 4 feet apart each way, and well cultivated for three years. The soft maple, cottonwood, box elder, ash, elm, Lombardy poplar, honey locust, catalpa and wild cherry are suitable for such purposes.

List of varieties, in the order of value and productiveness—*For family purposes:* Apple—For summer, Summer Rose, Red Astrachan, Carolina Red June, Primate, Lowell, Kirkbridge White, Jefferis; for autumn, Maiden's Blush, Wine, Rambo, Ortley, Twenty-ounce Apple, Fall Wine, Hawley, Bailey's Sweet, Swaar; for winter, Winesap, Newtown Spitzenberg, Rawles Genet, White Winter Pearmain, Jonathan, McAfee's Nonsuch, Whitney Russet.

Pear—Sheldon, Bartlett, Flemish Beauty, Vicar of Winkfield, Duchesse d'Angouleme, Louise Bonne de Jersey, Seckel. Peach—Early Louise, Hale's Early, Amsden's June, Alexander, Early Beatrice, Indian Blood Cling, Lemon Cling, Snow, Yellow Rareripe, Heath Cling, Old Mixon Free, Large Early York. Plum—Wild Goose. Cherry—Common Black Morello, English Morello, Early Richmond, Reine Hortense. *For market purposes:* Apple—Missouri Pippin, Ben Davis, Winesap, Rawles Genet, Rome Beauty, Jonathan, Summer Rose, Wine, Primate, Bentley Sweet. Pear—Bartlett, Flemish Beauty. Peach—Amsden's June, Alexander, Early Beatrice, Heath Cling, Indian Blood Cling, Hale's Early, Old Mixon Free, Large Early York. Plum—Wild Goose. Cherry—Early Richmond, Common Black Morello, English Morello.

List of varieties—proportions of each preferred for a family orchard of 100 trees: Apple—For summer, 2 Summer Rose, 2 Red Astrachan, 2 Carolina Red June, 2 Primate, 2 Lowell, 2 American Summer Pearmain, 2 Kirkbridge White, 2 Jefferis, 2 Hawley; for autumn, 2 Maiden's Blush, 2 Rambo, 2 Wine, 2 Ortley, 2 Bailey's Sweet, 2 Fall Pippin, 2 Fall Wine; for winter, 4 Grimes's Golden, 2 Roman Stem, 10 Winesap, 4 White Winter Pearmain, 10 Rawles Genet, 2 Swaar, 6 Bentley's Sweet, 4 Jonathan, 10 McAfee's Nonsuch, 6 Newtown Spitzenberg, 10 Missouri Pippin.

Preferred list for a market orchard of 1,000 trees—proportions of each named in the order of profit: Apple—250 Missouri Pippin, 250 Ben Davis, 200 Winesap, 100 Lawver, 100 Rome Beauty, 100 Jonathan.

SMALL FRUITS.

Location preferable: Blackberry, gooseberry, raspberry, immaterial; currant, north side of a stone wall; strawberry, in a partial shade.

Soil most productive: Rich, loose and sandy loam.

Preparation: Deep and thorough fall plowing.

Planting season: Blackberry, gooseberry, fall; the other classes in spring.

System: Blackberry and raspberry, in rows 10 feet apart. (Allow the rows to fill up with new plants.) Mud the roots thoroughly at the time of setting; currant, set in rows 4 feet apart, close to a stone wall; gooseberry, in rows 6 feet apart, and four feet in row; strawberry, in rows 4 feet apart, and one foot in row.

Cultivation: Mulch the rows heavily with coarse manure or old hay, and stir the land between thoroughly with a horse cultivator.

Pruning: Blackberry and raspberry, clip off ends of growing canes at 2 feet from the ground, and remove all dead wood in spring; currant and gooseberry, keep in well-formed clusters.

List of reliably productive varieties in the order of their value: Blackberry, Snyder, Kittatinny, Lawton; currant, Red Dutch, White Grape; gooseberry, Houghton, Pale Red, Mountain, Downing; raspberry, McCormick, Doolittle, Turner; strawberry, Wilson's Albany, Monarch of the West, Captain Jack, Warder.

The one variety which affords the most satisfactory results in plant and fruit: Blackberry, Kittatinny; currants, Red Dutch; gooseberry, Houghton; raspberry, McCormick; strawberry, Wilson's Albany.

Mulching has been an advantage in summer and winter.

Manuring is profitable with all classes of small fruits.

VINEYARDS.

Location most desirable: High, and well sub-drained.

Soil most productive: Loose, porous sandstone, or dry red limestone.

Preparation: Thorough and deep plowing.

Planting — manner and distance: In rows, 10 to 12 feet apart, and 8 feet in the rows. Dip the roots in a thin mud before setting, and plant on an inclined surface, pulverized fully 6 inches deep. Two-year-old, or strong one-year-old plants are preferable.

Cultivation: Same as for corn, with the additional hoeing needed to keep the rows clear of weeds.

Training and pruning: The fan system is the most practicable.

Preferred list of varieties in the order of success: For family use, Concord, Delaware, Martha; for market, Concord, Dracut Amber, Ives.

MISCELLANEOUS NOTES.

The extent of planting in 1880, of apple, pear, peach, plum, cherry and strawberry, was greater than in 1879; of gooseberry and raspberry, equal; and currant, less.

The present condition of horticultural investments is quite encouraging, and warrants greater efforts in the future. The interest and confidence in the pursuit of fruit growing is general.

(Southern half.)

BY C. C. KELSEY, HUMBOLDT.

ORCHARDS.

Date of first planting: Apple and cherry, in 1871; pear and plum, in 1876; peach, 1873, by C. C. Kelsey, Humboldt.

Date of first fruiting: Apple, in 1876; plum, in 1880; cherry and peach, in 1875.

Location most desirable: Apple, second bottom; pear, peach and cherry, prairie; plum, sheltered.

Soil most productive: Apple, black; pear, peach, plum and cherry, prairie or "ash" land.

Preparation: Deep plowing, leaving a dead-furrow where the row of trees is to be planted.

Planting season: As early in spring as the land can be prepared.

Method and distances: Set in the dead-furrow, made in plowing, (as above stated;) bank around the trees some 8 to 10 inches on to the body, to steady them; then with a turning-plow fill up the dead-furrow, by back-turning of the land; set 30 feet apart each way; lean the trees to the southwest. Treat all classes same as the apple. Set peach 20 feet; plum and cherry, in rows, north and south, 15 feet, east and west, 20 feet.

Cultivation: Plow between the rows, and mulch the trees after the first year.

Pruning: In fall, as soon as leaves drop, cut back the lower limbs, and in time remove them, so as to form the head 3 or 3½ feet from the ground; remove all interfering limbs. Pear, remove cross limbs; cut back limbs inclined to grow too strong. Peach, remove all small, weakened limbs. Plum needs but little pruning; cut out cross limbs and shorten in main branches. Cherry, enough limbs should be allowed to form to shade the body and main branches.

Wind-breaks, located on the northwest and south, are an advantage. Construct in rows, 8 feet apart and 6 to 8 feet in the row. Do not set the trees quite alternately, but so that the second and third row will fill the space given between trees in first row. This form will bring the trees in the first and fourth row exactly opposite each other, and form a complete obstruction to the force of winds. Maple, Lombardy poplar and peach trees are preferable for such purposes.

List of varieties, in the order of their value and productiveness — *For family purposes:* Apple — Winesap, Rawles Genet, Missouri Pippin, Limber Twig, Ben Davis, Willow Twig, Rambo, Maiden's Blush, Smith's Cider, Wagener, Rome Beauty, Red Astrachan, Early Harvest, Cooper's Early White, Lowell, Roman Stem. Pear — Bartlett, Duchesse d'Angouleme, Vicar of Winkfield, Louise Bonne de Jersey, Flemish Beauty, Clapp's Favorite. Peach — Amsden's June, Alexander, Hale's Early, Old Mixon, Heath Cling. Plum — Wild Goose. Cherry — Early Richmond, English Morello, Common Morello. *For market purposes:* Apple — Winesap, Rawles Genet, Missouri Pippin, Limber Twig, Ben Davis, Willow Twig. Pear — Bartlett, Duchesse d'Angouleme, Vicar of Winkfield, Louise Bonne de Jersey. Peach — Amsden's June, Alexander, Hale's Early, Old Mixon, Heath Cling. Plum — Wild Goose. Cherry — Early Richmond, English Morello.

List of varieties and proportions of each, for a family orchard of 100 trees: Apple — For summer, 5 Early Harvest, 5 Carolina Red June, 5 Red Astrachan; for autumn, 5 Maiden's Blush, 5 Lowell, 5 Rambo; for winter, 15 Winesap, 10 Limber Twig, 5 Jonathan, 5 Red Winter Pearmain, 5 Ben Davis, 5 Roman Stem, 5 Missouri Pippin, 5 Smith's Cider, 10 Rawles Genet, 5 Willow Twig.

List of varieties, number of each, named in the order of profit, most reliable for a market orchard of 1,000 trees: Apple — 200 Winesap, 100 Rawles Genet, 100 Missouri Pippin, 100 Limber Twig, 100 Willow Twig, 50 Jonathan, 50 Ben Davis, 50 Red Winter Pearmain, 50 Roman Stem, 50 Smith's Cider, 50 Rambo, 25 Maiden's Blush, 25 Carolina Red June, 25 Lowell.

SMALL FRUITS.

Location preferable: Currant, shaded; for other classes immaterial.

Soil most productive: Blackberry and red currant, upland prairie; same for other classes.

Preparation necessary: Blackberry, gooseberry, raspberry, deep and thoroughly pulverized; currant and strawberry, should be made rich.

Planting season: Spring for all classes.

System: Blackberry, in rows 6 feet apart and 4 feet in row; every 5th and 6th rows should be 10 feet apart, to give a wagon-road for hauling mulching and manure; currant, in rows 6 by 6 feet; gooseberry, in rows 6 feet apart and 4 feet in the rows; for blackcaps, 6 feet each way; red varieties 4 by 6 feet; strawberry, in rows 3 feet apart and 20 inches in the row.

Cultivation: Plow and hoe the first year and mulch afterwards, for all classes except the strawberry, among which the ground should be kept mellow and clear of weeds until established; then mulch between rows.

Pruning: Blackberry, cut back the canes in summer, and thin out where too thick; currant and gooseberry, cut out all weak and dead canes; raspberry, blackcaps, same as for blackberry; red varieties, prune in the spring.

List of varieties reliably productive, in the order of their value: Blackberry, Kittatinny, Wilson's Early, Lawton, Snyder; currant, Red Dutch; gooseberry, Houghton; raspberry, McCormick; strawberry, Wilson's Albany.

Mulching is an advantage, both summer and winter.

Manuring: Profitable for all classes. It should be well rotted, and applied in spring as top dressing; for the currant and strawberry, should be worked into the ground in the preparation for planting.

VINEYARDS.

Location most desirable: Northwest.

Soil most productive: Sandy loam.

Preparation necessary: Deep plowing and subsoiling.

Planting: Time, in spring, same as for an apple tree; distance—Concord, 8 feet apart each way; strong one-year-old plants are preferable.

Cultivation: With plow and hoe.

Training and pruning: Pinch back the fruit-bearing shoots to one leaf beyond the last bunch of grapes, and rub off all new growth not needed for bearing wood the following year.

The Concord is the only reliable variety.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that of 1879: Apple, peach, plum, less; pear and cherry, greater.

The present condition of horticultural investments, where properly taken care of, is good, and the results of the past years warrant extended investments in the future. The interest and confidence in this industry are quite general.

ATCHISON COUNTY.

BY THOS. F. COOK, MONROVIA.

ORCHARDS.

Date of first planting: Can only report on the apple, which was in 1857, by John Graves, Monrovia.

Date of first fruiting: Apple, in 1864, on the farm of the above.

Location most desirable: Apple and pear, north or northeast slope; peach and plum, the higher the better; cherry near timber.

Soil most productive: Apple, tolerably rich loam underlaid with limestone; peach and plum, same as for apple, but on a high elevation; cherry, elevations near timber.

Preparation: Subsoiled and well pulverized by harrowing for all classes.

Planting season: Spring.

Distances: Apple, 20 feet each way on high land, and 24 feet on low land; pear and peach 16 feet, and plum 10 feet each way.

Cultivation: In corn for seven or eight years, then sow to clover and turn hogs in with all classes excepting peach, plum and cherry, which should be sown to clover after the sixth year from planting.

Pruning: Apple, at any time during winter, when wood is not frozen, or in spring before sap starts. Remove only such limbs as interfere with each other and all water sprouts. Plum, pear and cherry require but little. Peach, only to give proper shape to the head.

Wind-breaks: Constructed on the southwest and north of an orchard or garden are an advantage. Soft maple in rows, cultivated the same as corn, until six or eight years old, has been a success. For an evergreen, the Scotch pine is excellent, when planted quite thick in rows.

List of varieties in the order of value and productiveness—*For family purposes:* Apple—Ben Davis, Winesap, Rawles Genet, Limber Twig, Willow Twig, Gilpin, Jonathan, Maiden's Blush, Rambo, Early Harvest, Carolina Red June, Duchess of Oldenburg. *For market purposes:* Apple—Ben Davis, Winesap, Jonathan, Limber Twig, Rawles Genet, Maiden's Blush, Rambo, Early Harvest, Carolina Red June, Missouri Pippin.

List of preferred varieties, and proportion of each, for a family orchard of 100 trees: Apple—For summer, 10 Early Harvest, 5 Carolina Red June; for autumn, 10 Maiden's Blush, 5 Rambo; for winter, 10 Ben Davis, 10 Missouri Pippin, 20 Winesap, 10 Rawles Genet, 10 Jonathan, 10 Limber Twig.

List of varieties reliable, and number of each, named in the order of profit, for a market orchard of 1,000 trees: Apple—200 Ben Davis, 200 Winesap, 100 Missouri Pippin, 100 Rawles Genet, 100 Jonathan, 100 Limber Twig, 50 Maiden's Blush, 50 Rambo, 50 Early Harvest, 50 Carolina Red June.

SMALL FRUITS.

Have no record of first planting.

Location and soil preferable: Do not discover any difference, excepting with currants, which should be shaded.

Planting-time: Spring, for all classes.

System: Blackberry — in rows 4 feet apart, and 2 feet in row.

List of varieties reliably productive, and in the order of value: Blackberry, Kittatinny, Lawton; gooseberry, Houghton and Pale Red.

The one variety affording most satisfactory results, in plant and product: Blackberry, Kittatinny; gooseberry, Houghton.

VINEYARDS.

Date of first planting: 1868, at Eden.

Location preferable: High and dry.

Soil — preparation: Deep plowing.

Planting: In rows, 7 feet apart each way. Strong two-year-old plants are the most suitable.

Cultivation: With a five-tooth cultivator, until the middle of July.

Pruning: Should be light.

For family and market purposes, the Concord is most successful.

MISCELLANEOUS NOTES.

The extent of planting in 1880 was greater of apple and peach, but light of all other classes.

The condition of apple orchards and vineyards, where properly taken care of, is satisfactory.

Small fruits are not profitable, only near cities.

There is a general interest and confidence among the people in the pursuit, and the results of the past year's investments warrant extension in the future.

BARTON COUNTY.

BY JOSEPH GAULT, GREAT BEND.

ORCHARDS.

This county, being of so recent settlement, affords no evidence sufficiently satisfactory to determine any of the questions naturally arising as to the most suitable locations, productive soils, etc. At the railroad experimental station, located at Ellinwood, in this county, in the year 1878, there were produced forty to fifty bushels of peaches. The station is located on bottom land near the Arkansas river. The same year, peaches were raised on the uplands.

Planting should be made in the spring, as fall-set trees are injured by the violent winter winds, causing rapid and exhaustive evaporation at a time when the condition of trees cannot endure it. I have planted apple, peach, pear and cherry trees 18 feet apart each way.

An orchard should receive careful and clean culture. If the space between the rows is to be used for crops, plant vines, beans and potatoes, or vegetables of a low growth. Corn is an injury to the trees. All cultivation should be done during the fore part of the season, and never in the latter part, as it will prevent the growth ripening sufficiently to pass our winters safely.

Pruning should be done in June, or when trees are in full vigor. Form the heads low, and while the trees are young, so as to avoid the necessity of cutting out large limbs when they are old.

Wind-breaks, located on the northeast and south, are an advantage to the orchard. Such protections should be close, similar to the planting of corn. Give them clean culture, and let nature do the pruning. Cottonwood and box elder are preferable for such purposes.

VINEYARDS.

Date of first planting: In 1877 and 1878.

The vines succeed on both upland and bottom; those on the upland the best.

The Concord is preferred.

MISCELLANEOUS NOTES.

Very light planting was done in 1880, on account of serious failures in 1879.

The present condition of horticultural investments is not very encouraging. A majority of our people do not believe that fruit can be successfully raised in this county. A few of us believe that perseverance and intelligent methods will result in success.

BUTLER COUNTY.

BY WM. H. LITSON, BENTON, AND LEANDER MILLER, ELDORADO.

ORCHARDS.

Date of first planting: Apple and peach, in 1858, by Geo. Donaldson, of Chelsea, (now deceased;) pear, 1869; plum and cherry, 1868, by Chas. Hegwin, of Sycamore.

Date of first fruiting: Apple, in 1864; peach, 1862, on the farm of Wm. Harrison, of Eldorado.

Location of apple and pear most desirable: Apple, upland or lowland, well drained. A western or northern slope preferred. Peaches, upland; plum, either upland or lowland; cherry, upland.

Soil most productive: Apple, limestone; peach and plum succeed on all kinds; cherry, any of medium fertility.

Preparation: Thorough and deep plowing.

Planting season: Both autumn and spring have been successful.

Planting—distances: Apple—The future stand of trees should be 2 rods apart each way, but may be advantageously planted only one rod apart, with the intention of removing alternate trees when they interfere. Pear—Set 20 feet apart each way, for standards, and dwarfs 12 feet. Peach—15 to 18 feet each way. Use one-year-old trees, and before planting, trim off all side limbs, and shorten in main stem to 2 or 3 feet in length. Plum—Set in rows 10 feet apart, and thin out alternate trees as they interfere, or set at standard distance, 18 feet. Do not approve of deep planting or deep holes. Cherry—Set 18 feet apart; lean trees slightly to the southwest, and mound around the base, for a support, until they become established.

Cultivation: Apple—Plow and plant to corn, and cultivate during the early part of the season. Never sow small grain in an orchard. Pear—Standards, same as for the apple; dwarfs require good cultivation. All cultivation for pears should be done so as to afford all the surface drainage practicable. Peach, plum and cherry should receive the same culture as the apple.

Pruning: Apple—At the time of planting, thin out and cut back the growth as may be necessary, to form a symmetrical head, leaving a leader in the center; afterwards remove all suckers and crossing limbs. All pruning should be done while trees are young, and in the growing season. If the orchard has been neglected, and it becomes necessary to cut out large limbs, remove them in early spring before the buds start, and cover the wounds with some composition, to facilitate the healing process. Pear—Only to form a pyramidal head. Peach—Form low heads, well balanced, and remove dead and decaying limbs. Plum—At time of planting treat same as the apple, and very little is needed thereafter. Cherry—Train low, and prune but very little.

Wind-breaks: Opinions are at variance. They are generally believed to be an advantage, when located on the south and west, constructed in rows 5 feet apart and 1½ feet in the row, and cultivated until they shade the ground. The cottonwood, box elder, Lombardy poplar, white elm, ash and catalpa have been successfully used.

The trees in this county are too young to determine any reliable list for planting. Of apples, the Early Harvest, Carolina Red June, Rawles Genet, Ben Davis, Missouri Pippin and Hubbardston's Nonsuch have fruited. Peaches—Hale's Early, Crawford's Early, Crawford's Late, Stump the World, Early York, Old Mixon Cling and Free, but only the Hale's Early has proven to be reliably valuable. Seedlings have borne two heavy and as many light crops. Plums—Cultivated varieties have not been profitable to this date. The Miner has bloomed profusely, but fails to mature a crop. The Sand and common wild varieties bear frequently. Cherry—

Early Richmond, common Morello and English Morello are promising. Sweet varieties have totally failed.

SMALL FRUITS.

Date of first planting: Blackberry in 1869, and currant 1870, by A. L. Redden, of Eldorado; gooseberry 1870, raspberry 1873, and strawberry 1869, by D. M. Bronson, of Eldorado.

Location preferable: Blackberry anywhere, if properly cared for; currant in shade; gooseberry on high lands, is not so subject to late frosts; raspberry, bottom land; strawberry, any moist situation.

Preparation necessary: Should be thoroughly plowed, and pulverized with a harrow.

Planting season: Blackberry, currant and gooseberry, autumn or very early spring; raspberry and strawberry in early spring. (NOTE.—Do not use old strawberry plants in setting a new bed.)

System: In hills, from 4 to 6 feet apart each way, except strawberry, which should be planted closely in the row.

Cultivation: Blackberry and raspberry, thorough through the first season; keep all sprouts pulled up which appear out of the rows of the blackberry. Currant and gooseberry, mulch continually. Strawberry, both the matted row and hill systems are recommended as successful.

Pruning: Blackberry, shorten the canes in summer, at two feet high and the lateral growth at eighteen inches from the cane; currant and gooseberry, cut out old wood and shorten in the stalks moderately.

List of varieties reliably productive, named in the order of their value: Blackberry, Kittatinny, Lawton; currant, Red Dutch, White Dutch; gooseberry, Houghton, Downing; raspberry, McCormick and native black caps, and for a red variety, Turner; strawberry, Kentucky, Wilson's Albany.

Mulching has been a decided advantage in summer and winter. Manuring is an advantage on upland soil; bottom land does not require it.

VINEYARDS.

Date of first planting: Spring of 1868, by Chas. Hegwin, of Sycamore.

Location most desirable: Hillside, with an eastern or western exposure.

Soil — preparation necessary: Deep and thorough plowing.

Planting: Use one or two-year-old plants, cut top back to one bud, and set in rows 8 to 10 feet apart each way.

Train to stakes or trellis, prune moderately, and cultivate in early summer.

Varieties successful for family use: Concord, Dracut Amber, Hartford Prolific, Iona; for market, Concord, Dracut Amber, and Catawba.

MISCELLANEOUS NOTES.

The planting in 1880 was in extent greater than in 1879.

The present condition of horticultural investments is good, and the horticulturists feel encouraged to extend their efforts.

CHASE COUNTY.

BY J. W. BYRAM, CEDAR POINT.

ORCHARDS

Planted in this county are of too recent date to determine a preference of locality, most productive soil, and successful management. Judging from the developments of wood growth, and success in planting, we can form an opinion only.

1st. The preparation of land selected for an orchard: Should be thoroughly plowed and well pulverized before planted—such preparation as would produce a No. 1 crop of corn will afford quite satisfactory results. Plowing the land in fall previous to planting the following spring, is recommended, and certainly has its merits.

2d. Planting of all classes should be done as early in the spring as the land can be properly prepared. So far the practice has obtained of setting apple trees, from 28 to 30 feet apart each way; pear and cherry, 8 to 10 feet; and peach, 8 feet.

3d. Cultivation should be at least equivalent to what is required for a corn crop.

4th. Pruning has not been practiced by our fruit-men to any extent. What little has been done was performed in February and March.

5th. Varieties that have fruited: Apple—Summer, Early Harvest, Cooper's Early White; autumn, Maiden's Blush, Rambo, Fall Wine; winter, Winesap, Jonathan, Ben Davis, Rawles Genet, Missouri Pippin, Gilpin, Swaar, and Nonsuch. Pear—Bartlett. These seem to take the lead.

SMALL FRUITS.

Date of first planting: All classes except the strawberry, in 1876, by I. Alexander, of Cottonwood Falls.

The blackberry has been productive on upland soil; gooseberry and raspberry, on bottom land.

The preparation of land for this class of fruits shoud be deep and thorough.

Preferred time for planting, in spring.

System: Blackberry, gooseberry and raspberry in rows, 6 feet apart and 4 feet in rows. Strawberry in rows, 4 feet apart and 18 inches in rows.

This class of fruit should receive constant culture to secure the best results, such as an energetic farmer would give to his vegetable garden.

Pruning: Remove all old wood; and for blackberry and raspberry, head back the new canes to two or three feet from the ground.

Varieties that have been successfully planted are the Kittatinny blackberry, Mountain and Pale Red gooseberry, Doolittle and Turner raspberry, Wilson's Albany, Kentucky, Crescent, and Captain Jack strawberry.

Mulching has been an advantage to small fruits during winter.

VINEYARDS.

Date of first planting: In 1874, by I. Alexander, of Cottonwood Falls.

A southern slope, and second bottom, are preferable for location and soil.

The preparation of land should be deep, by plowing and pulverizing.

Distances for planting: Eight feet each way; one-year-old plants are preferable.

Cultivation should be done in spring and early summer; a five-tooth cultivator is an excellent implement for such work.

Train low, to wire trellis. The stake and spiral form of training is practiced by some.

The Concord, for all purposes, has been the most successful variety of grapes.

The extent of planting in 1880 of apple was less than that in 1879, and very light of all other classes of fruit.

The present condition of fruit and tree planting is not very flattering. Some have hopes, but there is not a general feeling of confidence in horticultural investments in this county.

CHAUTAUQUA COUNTY.

BY ABRAM ELLIS, ELK CITY.

ORCHARDS.

Date of first planting: Apple and peach, in 1870; pear, plum and cherry, in 1871, by J. Conne and J. Coffee, Elk City.

Date of first fruiting: Apple and pear, in 1875; peach, 1873; plum and cherry, 1874, on the farm of this reporter.

Location most desirable: Apple, a ridge; peach and cherry, highest sloping lands.

Soil most productive: Apple and peach, deep and rich, with a mixture of sand; pear and plum, a deep soil — should be rich for plum; cherry, well drained.

Preparation: For apple, pear, peach, plum, cherry, such as is required for corn, and follow with subsoil plow.

Planting season: Spring, for all classes.

Distance: Apple, 30 feet each way. Pear, peach and cherry, 20 feet. Plums, in groves or clusters.

Cultivation: Such as is required to keep down weeds and grass.

Pruning: Season, in spring, as wounds heal better than at any other time. Pears require very little pruning, and peach, plum and cherry, none.

Wind-breaks: Do not recommend any other than an Osage orange hedge.

List of varieties in the order of their value and productiveness — *For family purposes:* Apple — For summer, Carolina Red June, Early Harvest, Red

Astrachan, Summer Queen, Large Yellow Bough, Trenton Early; for autumn, Maiden's Blush, Fall Pippin, Rambo, Autumn Swaar; for winter, Jonathan, Grimes's Golden, Red Winter Pearmain, Ben Davis, Tallman's Sweet, Rome Beauty, Baldwin, Wagener, Seek-no-further; long keepers, White Winter Pearmain, Winesap, English Golden Russet, Rawles Genet, Limber Twig, Gilpin. Pear—Bartlett, Louise Bonne de Jersey, Duchesse d' Angouleme. Peach—Amsden's June, Slater's Early, Troth's Early Red, Crawford's Early, Stump the World, Heath Cling, Crawford's Late, Ward's Late Free. Plum—Wild Goose, Lombard, Arkansas Valley. Cherry—Early Richmond, English Morello, Red Morello. *For market purposes:* Apple—Early Harvest, Red Astrachan, Summer Queen, Trenton Early, Maiden's Blush, Fall Pippin, Jonathan, Red Winter Pearmain, Grimes's Golden, Baldwin, White Winter Pearmain, Winesap. Peach—Amsden's June, Slater's Early, Troth's Early Red, Stump the World, Heath's Cling, Crawford's Late. Plum—Wild Goose, Arkansas Valley. Cherry—Early Richmond, English Morello.

A list of preferred varieties and proportion of each for a family orchard of 100 trees: Apple—For summer, 4 Early Harvest, 4 Carolina Red June, 4 Red Astrachan, 4 Summer Queen, 3 Large Yellow Bough, 3 Trenton Early; autumn, 5 Maiden's Blush, 5 Fall Pippin, 4 Rambo; for winter, 8 Jonathan, 8 Red Winter Pearmain, 8 Grimes's Golden, 8 Ben Davis, 6 Talman's Sweet, 5 Rome Beauty, 5 Baldwin, 8 White Winter Pearmain, 8 Winesap.

List of most reliable varieties for a market orchard of 1,000 trees, named in the order of profit, and the proportions of each: Apple—For summer, 20 Early Harvest, 20 Carolina Red June, 20 Red Astrachan, 20 Summer Queen, 10 Large Yellow Bough, 10 Trenton Early; for autumn, 30 Maiden's Blush, 30 Fall Pippin, 60 Jonathan; for winter, 60 Jonathan, 50 Red Winter Pearmain, 60 Grimes's Golden, 60 Ben Davis, 40 Yellow Bellflower, 40 Talman's Sweet, 60 Baldwin, 60 Gravenstein, 50 King of Tompkins County, 50 Westfield Seek-no-further, 60 Winesap, 60 White Winter Pearmain, 40 English Golden Russet, 40 Rawles Genet, 4 Willow Twig, 40 Spitzenberg, 40 Winter Rambo, 30 Gilpin, 20 Milam.

SMALL FRUITS.

Date of first planting: All classes, in 1871, by A. Ellis, of Elk City.

Location preferable: Immaterial.

Soil: Succeed on black sandy.

Preparation: Where the land is rich, same as for a corn crop, with the addition of mulching each year.

Planting season: In spring.

System: Blackberry, raspberry and gooseberry, in rows 4 feet apart, and 18 inches in row, and train to trellis; mulch heavily between rows. Currant, on north side of a stone wall; and if they do not succeed, then try them with the tops down, in the road. In mulching strawberry, place a corn stalk on each side of the row before the mulch is applied. They will keep the plants from smothering.

Cultivation: Maintain a good mulch. With strawberries the mulch must be moved from over the plants in spring.

Pruning: Blackberry, only to remove the dead canes; gooseberry, crowns must be divided every three or four years, to secure large fruit.

List of varieties reliably productive, and in the order of their value: Blackberry, Lawton, Kittatinny, Gooseberry, Houghton; strawberry, Wilson's Albany.

The Kittatinny blackberry, Houghton gooseberry, Red Antwerp raspberry and Wilson's Albany strawberry afford the most satisfactory results in plant and fruit.

Mulching has been an advantage in both summer and winter.

Manuring of poor soil is necessary for success with small fruits.

VINEYARDS.

Date of first planting: Spring, 1870, by John A. Hugg, Elk City.

Location, high slopes; soil, sandy.

Preparation of land: About the same as for potatoes or other root crops.

Planting—method: In rows 6 feet apart, train to stakes; two-year-old plants are most suitable.

Cultivation: Enough to keep the land mellow and destroy all weeds.

Pruning: Close system.

The Concord is the most satisfactory variety for all purposes.

The extent of planting in 1880 was much less than in 1879.

The present condition of investments in the fruit-growing pursuit promises a rich reward. There are no better investments made.

There is an interest and confidence sufficient to afford success; but for a lamentable lack of energy and perseverance, many fail.

CHEROKEE COUNTY.

(Western half.)

BY THOS. W. SMITH, BAXTER SPRINGS.

ORCHARDS.

Date of first planting: All classes were planted in 1869, by Wm. Highland and A. Gould, of Baxter Springs.

Location most desirable: Apple, pear, peach and cherry, a northwest slope; plum, bottom land.

Soil most productive: A sandy loam, mixed with gravel.

Preparation necessary: Deep plowing and thorough pulverizing.

Planting season: In the spring, just before the buds begin to start.

Distances: Apple, 28 to 30 feet; pear, 24 feet; peach and plum, 14 feet; cherry, 20 feet each. In the open prairie, I believe in the system of planting all classes as alternates in the apple orchard, thus forming a mutual protective combination, and is the most successful method.

Cultivation: Should be thorough and constant during the fore part of the season. I am not in favor of growing crops among them, such as beans, potatoes and other hoed vegetables, as the ground should be given entirely to the trees. After the apple, pear and cherry begin to fruit, sow to grass or clover. Plums should have the ground under the trees tramped, or made a chicken range.

Pruning: Time, latter part of May and fore part of June—never after the 1st of August.

Wind-breaks, located on all sides, have been a decided advantage to orchards and gardens. Construct in rows or groves. Osage orange hedges, allowed to run up, form a good shelter; also, maples have been successfully used.

List of varieties, named in the order of their value and productiveness—*For family purposes*: Apple—Early Harvest, Red Astrachan, Carolina Red June, Ben Davis. Pear—Bartlett, Flemish Beauty, Vicar of Winkfield, Duchesse d'Angouleme, Louise Bonne de Jersey, Osband's Summer, Seckel, Clapp's Favorite. Peach—Amsden's June, Alexander, Foster, Hale's Early, Large Early York (syn. Honest John), Hill's Home Chief, Late Admirable, Heath Cling, Ward's Late Free. Plum—Wild Goose, Weaver, Miner, Bradshaw. Cherry—Early Richmond, May Duke, Florence, Kentish, Leib.

The varieties preferable, and the number of each to plant, for a family orchard of 100 trees: Apple—For summer, 10 Carolina Red June, 5 Red Astrachan, 5 Early Strawberry, 5 Early Harvest; for autumn, 10 Maiden's Blush, 5 Large Yellow Bough, 5 Mother; for winter, 10 Winesap, 10 White Winter Pearmain, 25 Ben Davis, 5 Lawver, 5 Willow Twig.

For a market orchard of 1,000 trees, the Ben Davis will yield more money than any other variety. Its even size, productiveness and strong growth make it strictly the leading market variety.

SMALL FRUITS.

Date of first planting, 1868.

Location preferable: Blackberry and gooseberry succeed on most every kind; raspberry, sheltered northeast slope.

Soil most productive: A rich, sandy loam, well drained.

Preparation: Deep plowing, and thoroughly pulverized.

Planting time: Early spring for all classes except the strawberry, which should be set in the fall.

System: Blackberry, in rows 12 feet apart, and 8 feet in the row; gooseberry and raspberry, in rows 10 feet apart, and 7 feet in row; strawberry, in rows 3½ feet apart, and 20 inches in row.

Cultivation necessary: Deep plowing, and thoroughly pulverized.

List of varieties reliably productive, named in the order of their value: Blackberry, Kittatinny and Snyder; gooseberry, White Smith, Riley (a seedling), Houghton; raspberry, Missouri Cluster, Gregg, Doolittle; strawberry, Downing and Wilson's Albany.

The one variety which affords the most satisfactory results, in plant and fruit: Kittatinny blackberry, Houghton gooseberry, Black Cap raspberries, Wilson's Albany strawberry.

Mulching is an advantage in winter and late spring.

Manuring is profitable with all classes of small fruits; should be applied as a surface dressing, late in the fall, at the rate of 50 wagon-loads per acre, and thoroughly worked into the land.

VINEYARDS.

Date of first planting: In 1869, by Z. A. Hubbard, A. M. Armstrong, and Ed. Zeligan, of Baxter Springs.

The grape succeeds on most any kind of location, if properly treated.

Soil most productive: A black, sandy loam.

Preparation necessary: Deep stirring and pulverizing.

Planting: Should be in rows, 8 feet apart, and 6 feet in the row. One-year-old plants are preferable.

Cultivation: Plow in the fall, and cultivate during the fore part of the following season, to keep the ground loose and all weeds down.

Train to stakes four feet high; prune after the renewal system.

List of varieties, named in the order of their success: For family use, Concord, Clinton, Dracut Amber, Hartford Prolific, Ives, Delaware, Lady; for market, Concord, Dracut Amber, Clinton.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that for 1879, was much larger.

The present condition of horticultural investments is good, and the results of the past years, quite satisfactory.

(Eastern half.)

BY F. A. CHILDS, COLUMBUS.

ORCHARDS.

Date of first planting: Apple, pear and peach, from 1863 to 1870; plum and cherry, 1870 to 1875, by — Hubbard and Geo. A. Jones, Columbus.

Date of first fruiting: Apple, from five to eight years after planted; pear and cherry, two to three; peach and plum, three to four, on the farm of Geo. A. Jones.

Location most desirable: High, rolling prairie, for all classes, except for the plum, which succeeds better on lowland and near a poultry range.

Soil most productive: Moderately rich; a light manuring is beneficial to plum trees.

Preparation: For apple, pear and cherry should be well worked; peach and plum require thorough preparation and manuring.

Planting season: In autumn for all classes.

Distance: Apple, 30 feet; pear, 16 feet; peach, 20 feet; plum and cherry, 15 feet apart each way.

Cultivation: Apple and cherry, plant to corn or potatoes, and cultivate thoroughly until August 1st, during the first six or eight years after planted; pear, in early spring; peach and plum, constantly until middle of summer.

Pruning: Season for the apple, April and May; thin sparingly; never allow limbs which should be removed, to become large before cutting out. Pear and plum need very light trimming. Peach, shorten in the growth and thin out when it forms too densely. Cherry do not require pruning.

Wind-breaks: Apple orchards are benefited by a protection on the west and north. Construct in rows, quite thick, and as the trees enlarge thin out, so they will stand about five feet apart each way. Cultivate as required for corn, or mulch heavily. The varieties of trees successfully used for such purposes are Lombardy poplar, cottonwood, Osage orange, white maple and black walnut.

List of varieties which are productive, named in the order of their value—*For family purposes:* Apple—Carolina Red June, Early Harvest, Red Astrachan, Early Strawberry, Maiden's Blush, Winesap, White Winter Pearmain, and Ben Davis. Pear—Bartlett, Louise Bonne de Jersey and Duchesse d'Angouleme. Peach—Amsden's June, Hale's Early, Early York, Crawford's Early, Old Mixon Free, Stump the World, Smock, and Heath Cling. Plum—Wild Goose. Cherry—Early Richmond and Late Richmond. *For market purposes:* Apple—Red Astrachan, Carolina Red June, Winesap, and Ben Davis. Pear—Bartlett and Duchesse d'Angouleme. Peach—Amsden's June, Hale's Early, Crawford's Early, Foster, Old Mixon Free, and Stump the World. Plum—Wild Goose. Cherry—Early Richmond and Late Richmond.

List of varieties, and proportion of each, to be planted in a family orchard of 100 trees: Apple—For summer, 10 Carolina Red June, 5 Red Astrachan, 5 Early Strawberry, 5 Early Harvest; for autumn, 10 Maiden's Blush, 5 Large Yellow Bough, 5 Mother; for winter, 10 Winesap, 10 White Winter Pearmain, 25 Ben Davis, 5 Lawver.

For a market orchard of 1,000 trees, the Ben Davis will afford more money than any variety grown. Its even size, fine color, productiveness and vigorous growth, give it a preëminence in this respect, enjoyed by no other. Although the fruit lacks good quality, it commands a ready market. Next is preferred the Winesap. It is a smaller apple and not as good a keeper, but its color and flavor are splendid. The White Winter Pearmain possesses the finest quality, its main objection being its tendency to scab some seasons.

SMALL FRUITS.

First planting: Blackberry, by Oscar C. Williams, of Columbus.

Location preferable: Blackberry succeeds in all kinds; gooseberry, high;

raspberry, high and dry; strawberry, always on upland—bottom land is too loose.

Soil most productive: Blackberry succeeds on any; gooseberry, Houghton on any kind—other varieties moderately; raspberry does not succeed, only on manured land; strawberry requires a clay, mixed with sand.

Preparation necessary: Thoroughly plowed and pulverized for all classes—with manure for the raspberry.

Planting-time: In the fall for all classes except strawberry, which should be in the spring.

System: Blackberry and raspberry, in rows 8 to 10 feet apart, and quite thick in the row; gooseberry, set thickly in the rows, 7 feet apart; strawberry, line the place for the rows with a wheelbarrow, 5 feet apart, and set the plants in row one foot distant with a spade.

Cultivation necessary: Blackberry and gooseberry, use a plow between the rows; keep all weeds down. With raspberry, thorough plowing is the best for all seasons; a cultivator will do in dry years. Strawberry, do all the cultivation you can with a plow, and finish with a hoe.

Pruning: For blackberry and raspberry, thorough from the time the canes have grown two feet high until growth ceases in the fall; gooseberry, not necessary.

List of varieties reliably productive, named in the order of value: Blackberry, Kittatinny, Lawton, Snyder; currant, Red Dutch, White Dutch; gooseberry, Houghton; raspberry, Doolittle, McCormick (syn. Mammoth Cluster), for red variety, the Turner; strawberry, Chas. Downing, Kentucky, Crescent, Captain Jack, Wilson's Albany.

The one variety which affords the most satisfactory results in plant and fruit: Blackberry, Kittatinny; currant, Red and White Dutch; gooseberry, Houghton; raspberry, McCormick; strawberry, Chas. Downing.

Mulching has been an advantage in summer and winter.

Manuring has been profitable in the order named: 1st, raspberry; 2d, blackberry; 3d, raspberry. Strawberry should be manured with common litter, in autumn after the cultivation ceases; apply to all classes a surface dressing of coarse manure to an extent sufficient to form a mulch to keep down the weeds.

VINEYARDS.

There are only a few planted in this county; seem to succeed quite well. Rot has been rather severe on the fruit until the last year. The Concord leads.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that of 1879, of apple, peach, plum, was 20 to 25 per cent. greater; pear, cherry, blackberry, currant, gooseberry, equal to; raspberry, less; strawberry, 100 per cent. greater.

The present condition of horticultural investments is fair, and the results of the past years will warrant increased effort to a limited extent. I believe the interest and confidence of the people in the pursuit of fruit-growing are quite general.

CLOUD COUNTY.

BY C. H. SHEFFIELD, GLASCO.

ORCHARDS.

Date of first planting: All classes in the spring of 1862, by Nicholas Hageman, Red Stone.

First fruiting, on the farm of the above-mentioned planter.

Location most desirable: Upland, with a northern or northwestern slope. Peach, immaterial; plum, bottom land; cherry, any other than bottom land.

Soil most productive: Apple, upland that would produce a good crop of corn; pear, sandy upland; peach, immaterial as to kind; plum, bottom land; cherry, well-drained prairie.

Preparation: Deep plowing and thorough pulverizing.

Planting: In spring, for all classes.

Distances: Apple, 20 feet; pear, standard 25 feet, dwarfs 16 feet; peach and cherry, 16 feet; plum, 12 feet each way.

Cultivation: Apple and pear, thorough for five years, in the spring and early summer; for peach, plum and cherry, during the first two years.

Pruning — Apple, in spring, to balance the top, a little to the south. Other classes require very little pruning.

Wind-breaks, located on the south, have been an advantage. Construct in rows 4 feet each way, and as the trees crowd, thin out to eventually stand 8 feet apart. Cultivate as for corn during the first three years. Cottonwood, box elder, and in some instances peach trees, have been used successfully.

List of varieties, in the order of their value and productiveness — *For family purposes:* Apple — Carolina Red June, Cooper's Early White, Maiden's Blush, Ben Davis, Rawles Genet, Winesap, White Winter Pearmain. Peach — Amsden's June, Crawford's Early, Early York. Plum — Wild Goose, Chickasaw, Sand. Cherry — Early Richmond, English Morello. *For market purposes:* Apple — Cooper's Early White, Carolina Red June, Ben Davis, Jonathan, Rawles Genet, Winesap. Peach — Amsden's June, Large Early York, Crawford's Early, Stump the World. Plum — Sand, Chickasaw. Cherry — Early Richmond.

List of varieties and proportion of each, to plant for a family orchard of 100 trees: Apple — Summer, 5 Carolina Red June, 5 Red Astrachan; autumn, 5 Cooper's Early White, 5 Maiden's Blush; winter, 20 Ben Davis, 20 Winesap, 20 Rawles Genet, 20 Missouri Pippin.

List of varieties most reliable, proportions of each to plant, named in the order of profit, for a market orchard of 1,000 trees: 25 Carolina Red June, 25 Red Astrachan, 50 Cooper's Early White, 25 Lowell, 250 Ben Davis, 200 Winesap, 100 Missouri Pippin, 225 Rawles Genet. [Lacks 100.]

SMALL FRUITS.

Date of first planting, in the spring of 1865, by N. Hageman, of Redstone.

Location preferable: Blackberry and gooseberry, immaterial; currant, shaded; raspberry, southern slope.

Soil most productive: Rich prairie loam, well drained. Strawberries require a sandy land.

Preparation: Plow, harrow, and prepare as for corn.

Planting: Season, spring; blackberry, in rows 4 feet apart; gooseberry and raspberry, 5 feet; strawberry, grow in matted rows.

Cultivation: None is required, if properly mulched.

List of varieties reliably productive, in the order of value: Blackberry, Kittatinny, Snyder, Western Triumph; currant, Red Dutch, Cherry.

The one variety affording the most satisfactory results, in plant and fruit: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Downing; raspberry, McCormick; strawberry, Wilson's Albany.

Mulching is an advantage in summer and winter.

Manuring of the strawberry and gooseberry is profitable; should be applied to the land in autumn, and plowed under.

VINEYARDS.

Date of first planting: In spring of 1865, by N. Hageman, now residing at Concordia.

Location most desirable: Upland, with a southern slope.

Plant in rows 8 feet apart, running north and south, and 6 feet in the row; two-year-old plants are preferable; train to trellis. The Concord is the most reliable variety.

MISCELLANEOUS NOTES.

The extent of planting in 1880, of pear, cherry, blackberry, gooseberry, and raspberry, greater than in 1879; apple, peach, plum and strawberry, less.

The present condition of horticultural investments is not encouraging, and yet the results of the past years are sufficiently satisfactory to warrant extended efforts in the production of fruit in the future. The interest and confidence of the people in the pursuit are quite general.

CRAWFORD COUNTY.

BY THOS. PING, GIRARD.

ORCHARDS.

Date of first planting: Apple, spring of 1868, by W. D. Warmsle; pear, spring of 1870, by Jesse Timmerman; peach, spring of 1865, by W. Banks; plum, spring of 1879, by Peter Diltz; cherry, spring of 1869; by D. W. Burnett and J. C. Small, of Girard.

Date of first fruiting: Apple, in 1873, by Arthur Sharp; pear, in 1877, by J. Timmerman; peach, in 1870, by A. Crites; plum, in 1878, by P. Diltz; cherry, in 1875, by D. W. Burnett and J. C. Small, on their respective farms, near Girard.

Location most desirable: Apple and pear, high and rolling, sloping to the northeast; peach and plum, fertile dry upland; cherry, sloping to the southeast, and sheltered on the northwest.

Soil most productive: Apple, pear and cherry, dry black or red loam, on upland; peach and plum, bottoms, near water-courses.

Preparation of soil: Should be well cultivated in corn for several years, or until fully subdued; then open a deep furrow where the rows are to be planted, and back-furrow to it. This is necessary for all classes except the plum, which does not require so much care.

Season preferable for planting: Apple and pear, middle of October to that of November; peach, fore part of April; plum, last half of April; cherry, first half of October.

System for planting: Apple and pear—Should be 16 feet apart each way; dig a hole at least four feet across, and loosen the ground six inches deeper than is required, to receive the roots when properly planted; mud the roots well, and set two inches deeper than when the tree was in the nursery row. Peach—Plow into ridges, and plant thereon 15 feet apart, each way. Plum—12 feet apart, on land not deeply prepared. Cherry—12 feet apart; treatment in planting same as for apples on ridged land.

System of culture: Ridge the rows of trees in the fall, to furnish drainage during winter; in the growing season, cultivate in corn for four or five years; then seed with clover and timothy, and turn under every two years; manure around the trees. Pears require the same treatment as apples, with the exception of turning the sward under, which should be done every fourth year, and in November or December. Peach—Cultivate in corn for the first three years after planted; then seed with clover and timothy, and turn under and re-seed every two years thereafter. Plum—Cultivate lightly; keep weeds down and ground clean. It should be tramped down around the trees, to produce a good crop. Cherry—Cultivate in vines for two years after planted; then sow to clover, timothy and blue-grass; manure around the trees, and if worked on the Morello root, keep the sprout cut out.

Pruning—system and time: Shape the tree to form your desire when planted. If the head should develop to one side, cut back the growth on that side, to produce a balance. Do the work in August. Pear—Prune at any time, so as to maintain a good form; cut back strong limbs inclined to run up. Peach—In fall and winter; form the heads 4 feet from the ground; remove all tendency to fork; renew the wood by cutting off the old limbs every two or three years. Cherry—Treat same as the peach, with the exception of renewing the top every six to eight years.

Wind-breaks have not been an advantage.

A list of varieties, in the order of their value—*For family purposes:* Apple—Summer, Early Harvest, Carolina Red June, American Summer Pearmain; autumn, Maiden's Blush, Rambo, Fall Wine, Winter Winesap, Stogsdill Red, Jonathan, White Winter Pearmain, and Rome Beauty. Pear—Bartlett. Peach—Crawford's Early, Hale's Early, Crawford's Late, Large Early York, Alexander, and Large Red, (has a good flavor, and keeper, cooks well; came from Pulaski county, Ky.) Plum—Wild Goose, Green Gage, and Girard Full. Cherry—Early Richmond, English Morello, Purple Hart, and Early May. *For market purposes:* Apple—Summer, Early Harvest, Carolina Red June, American Summer Pearmain; autumn, Maiden's Blush, Rambo, Fall Wine, Jonathan, Lowell; winter, Winesap, Stogsdill Red, Jonathan, and White Winter Pearmain. Pear—Bartlett. Peach—Crawford's Early, Hale's Early, Crawford's Late, Large Early York, Alexander, and Snow. Plum—Wild Goose and Green Gage. Cherry—Early Richmond, English Morello, Early May, and Purple Heart.

List of preferred varieties for a family orchard of 100 trees, and proportioned number of each: Apple—Summer, 5 Early Harvest, 5 Carolina Red June, 5 American Summer Pearmain, 5 Summer Queen, 5 Lowell; autumn, 5 Maiden's Blush, 5 Rambo, 5 Golden Russet, 5 Jonathan, 5 Lowell; winter, 10 Winesap, 10 Stogsdill Red, 10 Jonathan, 10 White Winter Pearmain, 10 Rome Beauty.

(NOTE.—The age of trees in this county will not warrant a recommendation of varieties for a market orchard.)

SMALL FRUITS.

Date of first planting: Blackberry and gooseberry, in 1872, by George Richie; currant, in 1872, by John Bailey; raspberry, in 1871, by Dr. A. Turner; strawberry, in 1872, by A. M. Sidwell. Post office, Girard.

Location preferable: Blackberry, high, dry and sloping to northeast or north; currant, the north side of a stone wall or board fence; gooseberry, high, dry, and sloping to the south; raspberry, well drained, a partial shade desirable; strawberry, southern slope.

Soil most productive: For blackberry, currant, gooseberry, raspberry and strawberry, black or red loam.

Soil—preparation necessary: Deep plowing for all classes.

Season for planting: Blackberry, in September or October; currant, in September; gooseberry, in July; raspberry and strawberry, in August.

System for planting: Blackberry—Rows running north and south, 6 feet apart and 3 feet in the row, set 6 inches deep; currant, in rows, plants 2 feet apart and set 8 inches deep; gooseberry, in rows north and south, 4 feet apart and 2½ feet in the row, set 5 inches deep; raspberry, in rows 6 feet apart and 3 feet in the row; strawberry, in rows 3 feet apart and 18 inches in the row.

Cultivation necessary: Blackberries—Keep the land clean and worked to ridges, plow and mulch with alternate years. All other classes, keep free from weeds, and well cultivated.

Pruning: Blackberry, nip the end of canes as soon as they reach 3 feet high, and the latter growth at 1 foot from the cane; currants, thin out in November; gooseberry, leave only three stalks to a hill, cut them back to 18 inches high in August; raspberry, pinch off the end of the growing cane at 3 feet high, and the laterals at 1 foot from the cane.

A list of established varieties, reliable and in the order of value: Blackberry, Kittatinny, Lawton; currant, Large Red Dutch; gooseberry, Houghton; raspberry, Doolittle; strawberry, Wilson's Albany, Chas. Downing.

Mulching has been profitable in summer and winter.

Manuring is profitable for all small fruits—scattered broadcast in September and October, at the rate of ten wagon-loads to an acre.

VINEYARDS.

Date of first planting: Spring of 1871, by W. B. Curtis, of Girard.

Location most desirable: High, sloping to the southeast.

Soil most productive: Dry, black loam.

Preparation of soil: Deep stirring, and turned into ridges 8 feet apart, running north and south.

Planting: Eight feet apart in rows north and south. Set plants one foot deep. Two-year-old plants are most desirable.

Cultivation: Plow only north and south, and not after June 1st. Keep clear of weeds with the hoe.

System of training and pruning: Wire trellis preferable for a support; cut away the wood of last year's growth, leaving only eight buds on each cane, in October.

List preferred for family use, Concord; for market, Concord.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that of 1879: Apple, 20 per cent. greater; pear, peach, gooseberry and strawberry, 10 per cent. greater; plum and blackberry, 5 per cent., and cherry 25 per cent. greater.

The present condition of horticultural investments is satisfactory, and will warrant an extended investment hereafter. The interest among the people is more general.

DAVIS COUNTY.

BY WM. CUTTER, JUNCTION CITY.

ORCHARDS.

Date of first planting: Apple, in 1860; pear, in 1870; peach, plum and cherry, in 1860, by Theodore Jones, of Junction City.

Location preferable: Sheltered from the winds, on all classes.

Soil most productive: Apple, rich, dry land produces best crops; pear, sandy for standards, clay subsoil for dwarfs; peach, any good corn land; plum, trees grow well on any; cherry, no material difference.

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Preparation of soil: For the apple, plow deep, open a furrow where the row is to be planted towards the lowest side, for the purpose of drainage; turn the ground back into the furrow, and plant thereon. Give the same preparation to land designated for any of the orchard classes.

Season for planting: For the apple and pear, late fall or early spring; peach, plum and cherry, in spring.

Method for planting: In any way that they may be protected when fruiting from birds, chickens, and boys.

System of cultivation: Apple—Cultivate corn in the orchard until the trees interfere, then mulch around them and mow the weeds. Pear—Standards require very little cultivation; dwarfs need constant cultivation. Peach—Cultivate in corn two or three years; thereafter cut the weeds down, and take out the borers twice a year. Plum—Cultivate for two years, and keep the sprouts cut down thereafter. Cherry—Cultivate for two or three years; then mulch the trees and mow the weeds. Apple—Distance, 25 to 30 feet apart. In this windy country, it is a good plan to alternate with peach or some of the early-bearing varieties, as the Missouri Pippin, Cooper's Early White, and other *poor*, but productive sorts. Pear—Distance, 12 feet each way. Plant dwarfs deep, that roots may form from above the place of budding. Peach—Set seedlings in rows, 12 feet one way and 4 feet the other. Thin out worthless sorts after the first crop; budded varieties, 12 feet each way. Select small trees, and cut back the top to 1½ feet. Plums—Set a row where the fowls frequent. Obtain trees propagated on plum root, and not on the peach. Cherry—Set 12 by 15 feet, and the nearer the dwelling house the better.

Pruning—time and manner: Apple—Shorten in the limbs one-half; at time of planting remove all suckers; keep the head balanced by shortening in any limbs which develop too strongly on either side; keep it thinned out, to prevent smothering of the center growth. Pear—Keep the head as low and compact as practicable, by shortening in the outward growth each year, in spring-time. Peach—Form the head at one foot from the ground; arrange the limbs regularly along the center stem; shorten in the side limbs in May and July; avoid all forks. Plum—Cut back the top and remove all suckers. Cherry—Maintain a body 12 to 18 inches high. Do not thin out the top until the tree is 6 or 8 years old; then remove those branches which have been most fruitful, to give place to younger limbs.

Wind-breaks on the south side are a benefit.

List of varieties, in the order of their value and productiveness—*For family purposes*: Apple—Ben Davis, Grimes's Golden, Jonathan, Gramar's Pearmain, Maiden's Blush, Rawles Genet, Woodbridge, Duchess of Oldenburgh, Winesap, Lowell, Fulton, Smith's Cider, Fink, Mother. Pear—Flemish Beauty, Bartlett, Clapp's Favorite, Belle Lucrative, Seckel. Peach—Amsden's June, Hale's Early, Heath's Cling, Ward's Late Free, Troth's Early

Red, Old Mixon Free, Early York, Lagrange. Plum—Emigrant, Lombard, choice natives, Wild Goose, Miner. Cherry—Early Richmond, English Morello, common Morello. *For market purposes:* Apple—Ben Davis, Maiden's Blush, Jonathan, Missouri Pippin, Fink (for a keeper), Sops of Wine. Pear—Bartlett and Flemish Beauty. Peach—Amsden's June, Heath Cling, Old Mixon Free, Ward's Late Free, Troth's Early Red, Hale's Early. Cherry—Early Richmond and English Morello.

Varieties preferred, and number of each, for a family orchard of 100 trees: Apple—Summer, 3 Early Harvest, 3 Summer Rose, 3 Woodbridge, 2 Cole's Quince; autumn, 5 Gramar's Pearmain, 5 Maiden's Blush, 5 Grimes's Golden, 3 Fulton, 2 Fall Wine; winter, 20 Ben Davis, 10 Jonathan, 10 Rawles Genet, 10 Winesap, 10 Fink, 10 Smith's Cider.

A list of most reliable varieties, named in the order of profit, and proportion of each, for a market orchard of 1,000 trees: Apples—500 Ben Davis, 100 Rawles Genet, 100 Missouri Pippin, 100 Jonathan, 50 Maiden's Blush, 50 Fink, 25 Woodbridge, 50 Winesap, 25 Sops of Wine.

SMALL FRUITS.

Location preferable: Blackberry and raspberry, northern exposure; currant, a shady place; gooseberry, immaterial; strawberry, eastern exposure.

Soil most productive: Blackberry, rich bottom; gooseberry and currant, any good ground; raspberry, bottoms; strawberry, good and light.

Preparation of soil: Thorough plowing and harrowing for all classes.

Time for planting: Spring for all classes except the strawberry, which should be planted in August, and mulched.

System for planting: Blackberry—Open trenches with the plow 10 feet apart, and drop sections of roots 6 to 8 inches long, 4 feet apart, and cover them. They are as sure to grow as plants. These sections should not be exposed to sun or winds, as drying is as fatal as to an evergreen tree. Currant, set 4 to 6 feet.

Cultivation: Blackberry, currant, gooseberry, raspberry, while young, and then mulch; strawberry, mulch the rows, and cultivate between.

Pruning: Blackberry, cut the canes back to 3½ feet from the ground, and shorten in the laterals; currant, cut out the suckers; gooseberry, cut off side limbs that are liable to take root, and thin out the stools; raspberry, head back the canes 3 feet from the ground, and remove old wood.

Varieties reliably productive, in the order of value: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Houghton; raspberry, McCormick and native varieties; strawberry, Chas. Downing, Downer's Prolific.

The one variety most satisfactory in plant and product: All the above last-mentioned, except Downer's Prolific strawberry.

Manuring is a benefit to any fruit-bearing plant, when the land has been impoverished by heavy crops. Well-rotted manure should be used as a surface dressing, and worked in with a cultivator.

VINEYARDS.

Date of first planting, 1873, by Ed. Laurenson, Junction City.

Location preferable: Second bottom, sloping for drainage.

Soil most productive: Rich and deep, the better if a little sandy.

Soil—preparation: Very deep plowing.

System of planting: In rows with the course of the slope. Set 8 feet apart, and 4 feet in the row. Always use first-class one-year-old plants.

Cultivation: With a cultivator, as often as required to keep down weeds. Potatoes can be grown between rows during the first two years.

Training and pruning: Train to a single cane for the first two or three years and cut back to two or three eyes. Whenever it becomes feeble, from fruiting or other causes, start another. Train to stakes or trellis.

For family use, in the order of success: Concord, Ives and Catawba are preferred; for market, the same list, with a few Delaware.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that of 1879: Apple, pear, cherry, greater; plum, blackberry, gooseberry, raspberry, equal; pear, currant and strawberry, less.

The present condition of horticultural investments, where properly cared for, promises successful results, and the intelligent classes are beginning to plant by the thousand.

BY NEWELL TRAFTON, MILFORD.

ORCHARDS.

Date of first planting: In 1861, by Englehart Bartell, then of Milford, since removed to Texas.

Date of first fruiting: Apple, in 1866.

Location most desirable: High and rolling, with a northern exposure.

Soil most productive: Apple, peach and cherry, rich sandy loam, well drained; pear, fair for good corn land—rather sandy, with porous subsoil, well drained.

Preparation: The best possible condition attainable by deep, thorough plowing and harrowing.

Planting season: Spring.

Method and distances: Apple and pear—In rows, 24 feet each way; and in those running north and south, alternate with peach, which remove whenever they interfere with the apple. Peach and cherry—In rows, 16 feet each way. Plum—12 feet each way.

Cultivation—Plant in corn, and cultivate deep away from, and shallow near the trees; cease by July 1st. Cultivate pear the same, and mulch the tree-row. The same treatment is advisable with the peach, plum and cherry; if the last have been worked on the common Morello stock, then it is best to keep down weeds with hoe, rather than plow, so as to avoid breaking the roots, which will cause extensive sprouting.

Pruning: Apple—In early spring remove all suckers, forming the head from 2½ to 3 feet from the ground; maintain a center-stem, from which encourage a regular development of branches sufficiently distant to admit of air and sunlight. Pear—In spring, to produce low, open heads. Peach—In early summer, in manner recommended for apples. Plum—To form round, well-balanced head. Cherry—The Early Richmond (syn. May) and May Duke require very little pruning, the Belle Magnifique and Morello, none.

Wind-breaks located on the south and west are of great advantage to an orchard or garden. Construct in rows 12 feet apart, and 6 feet in the row. Cultivate for five or six years. Box Elder, White Maple and Black Walnut have been used successfully.

List of varieties, in the order of their value and productiveness—*For family purposes:* Apple—Winesap, Ben Davis, Willow Twig, Maiden's Blush, Lowell, Fameuse, Rawles Genet, Duchess of Oldenburgh, Early Harvest, Carolina Red June, Wagener, Gilpin, Red Astrachan. Pear—Bartlett, Flemish Beauty, Louise Bonne de Jersey. Peach—Crawford's Early, Large Early York, Hale's Early, Heath Cling, Amsden's June, Alexander, and Steadley. Cherry—Early Richmond and Red Morello.

List of varieties, and proportions of each, preferred for a family orchard of 100 trees: Apples—Summer, 2 Early Harvest, 3 Carolina Red June, 2 Duchess of Oldenburgh, 2 Trenton Early, 5 Red Astrachan; autumn, 6 Lowell, 5 Maiden's Blush, 2 Rambo, 5 Fameuse, 2 Bailey's Sweet; winter, 12 Winesap, 10 Ben Davis, 10 Rawles Genet, 6 Jonathan, 6 Wagener, 5 Willow Twig, 5 Rome Beauty, 5 Dominie, 5 Grimes's Golden, 2 Talman or Bailey's Sweet.

List of varieties, and proportions of each, named in the order of profit, most reliable for a market orchard of 1,000 trees: 300 Ben Davis, 200 Winesap, 100 Willow Twig, 100 Rawles Genet, 100 Jonathan, 25 Gilpin, 25 Dominie, 25 Missouri Pippin, 15 Wagener, 10 Rome Beauty, 7 Grimes's Golden, 10 Early Harvest, 10 Carolina Red June, 5 Hightop Sweet (syn. Sweet June), 15 Red Astrachan, 10 Duchess of Oldenburgh, 10 Lowell, 15 Maiden's Blush, 10 Fameuse, 5 Bailey's Sweet.

SMALL FRUITS.

Location preferable: Blackberry, gooseberry, raspberry, upland, with a northern exposure; currant, shaded; strawberry, southeast exposure, well drained.

Soil most productive: Blackberry, deep, rich loam; currant, moist loam; gooseberry, deep, moist, black loam; raspberry, rich, moist sandy loam; strawberry, deep, moist, light, and warm.

Preparation: For all classes, plowed deep, and thoroughly harrowed; currants, well mulched.

Planting season: In early spring.

System: Blackberry, in rows 6 feet apart, 4 feet in rows; currant, in rows

5 feet apart, and 4 feet in rows—keep in hills; gooseberry, in rows 6 feet apart, and in hills 5 feet in the row; raspberry, in rows 6 feet apart, and in hills 4 to 5 feet in the row; strawberry, in beds three feet wide, and three feet space between the beds, for the purpose of a new bed whenever needed.

Cultivation: Thorough, but shallow, near the plants; currants, mulching is all that is needed.

Pruning: Blackberry and raspberry, cut back the main canes to three feet in length, and side branches to 20 inches from the cane. Remove all old canes. Currant and gooseberry, remove old unproductive wood in the fall, and head in one-quarter of the season's growth, if it has been strong and heavy.

List of varieties reliably productive, in the order of their value: Blackberry, Kittatinny and Lawton; currant, Red Dutch; gooseberry, Houghton; raspberry, Turner and Miami; strawberry, Charles Downing and Wilson's Albany.

The one variety that affords the most satisfactory results, in plant and product: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Houghton; raspberry, Miami; strawberry, Charles Downing.

Mulching has been an advantage to currant, raspberry and strawberry in summer, and strawberry in winter.

Manuring is profitable to all classes on upland, scattered broadcast, in fall or early spring.

VINEYARDS.

Location preferable: Upland, having a south or southeast exposure, to produce early ripening fruit, and a north or northeast to extend the season of ripening.

Soil most productive: Immaterial with the Concord and Clinton. The Delaware requires a warm, sandy loam.

Preparation: Heavy land requires deep, thorough plowing and harrowing.

Planting: Distance in rows, 8 feet apart and 8 to 10 feet in the row. First-class one-year-old plants are preferable.

Cultivation: With a one-horse turning-plow, turn the land to the center between the rows; with a hoe cut out the weeds in rows, and in a few days turn the dirt towards the vines; cultivate early in the season and again late in fall; train to trellis.

Preferred varieties, in order of success: For family use, Concord, Ives, Clinton, Delaware, and Goethe; for market, Concord, Ives, and Goethe.

MISCELLANEOUS NOTES.

The extent of planting in 1880 was much greater than in 1879.

The present condition of horticulture is generally good. Trees from home nurseries give much better satisfaction than from abroad.

The results of the past years are quite satisfactory, and the interest and confidence in fruit-growing are general among the people of this county.

DICKINSON COUNTY.

BY J. W. ROBSON, CHEEVER.

ORCHARDS.

Date of first planting: Apple, in 1865; pear, plum and cherry, in 1870; peach, in 1860; by —— Packard, of Enterprise, 'Squire Barber and T. C. Henry of Abilene.

Date of first fruiting: Apple, in 1870; peach, in 1869—large crop in 1872; plum, in 1876; cherry, in 1872—on the farms of the above mentioned planters, and J. W. Robson, of Abilene.

Location most desirable: Apple—The first planted were on river and creek bottoms, and most of them are now among the things that were; those planted on uplands during the last decade have done well. Pear are not a success. Peach, plum and cherry—Second bottom and upland, even at the base of the sand-hills, has proven to be a good one.

Soil most productive: For apple, peach and plum—light loamy, of which the upland farms are composed in this county; cherry, in every variety of soil.

Preparation necessary: Deep plowing, for all classes.

Distances: Apple—In rows, 25 feet apart each way. Lay off the land with a plow each way, and open holes for the trees in the checks made by the cross of rows. In setting the trees, straighten all the fibrous roots and closely pack the dirt about them and under the base of the stem. Mulching should be applied as soon as planting is done. Two-year-old trees are the most suitable. Peach—In rows 20 feet apart. Use one-year-old trees from the bud. Plum—Set 16 feet apart. Cherry—Set 16 feet apart, and use one and two-year-old trees. The treatment given for planting of the apple should be followed with all classes.

Cultivation: All classes should be cultivated during the first five or six years. Corn is the best crop to grow in an orchard. Leave the stalks standing until spring, for a protection and to prevent snow from drifting. The land should not be stirred after the month of June.

Pruning: Apple—Remove all branches liable to interfere, at any time—better when quite small. The saw or chisel should never be taken into an orchard except in case of accident or dire necessity. Pear—Treat the same as apple, only in that the strong shoots should be shortened in during the growing season. Peach—Terminal and strong side shoots should be cut back one-third of their length every winter. Plum and cherry require but little thinning of their tops.

Wind-breaks are indispensable in this section. Should be constructed on the north and south sides, and 12 feet from the first row of orchard trees.

Plant in rows 6 feet apart, and 6 feet in the row. The breadth of the shelter on the north side should be 20 rods, and on the south 3 rods. Cultivate with horse cultivator several times each season, until the trees prevent by interfering. Varieties of trees used for such purposes, box elder, ash, elm. Cottonwood succeeded for six years, but borers are making severe attacks upon it.

List of varieties, in the order of value and productiveness—*For family purposes:* Apple—Cooper's Early White, Maiden's Blush, Lowell, Fameuse, Jonathan, Missouri Pippin, Winesap, Ben Davis, Grimes's Golden, Rawles Genet, Willow Twig, Gilpin, Fink. Pear—Flemish Beauty. Peach—Amsden's June, Hale's Early, Troth's Early Red, Crawford's Early, Crawford's Late, Heath Cling. Plum—Miner and Emigrant. Cherry—Early Richmond, Late Richmond, Leib, Belle Magnifique, common Morello. *For market purposes:* Apple and pear—Have not been sufficiently tested to determine their market qualities. Peach—Amsden's June, Hale's Early, Crawford's Early, Crawford's Late, Heath Cling, and select Kansas seedlings. Cherry—Early Richmond.

List of varieties, and proportions of each, preferred for a family orchard of 100 trees: Apple—Summer, 2 Early Harvest, 2 Carolina Red June, 2 Early Pennock, 2 Cooper's Early White; autumn, 2 Maiden's Blush, 2 Lowell, 2 Fall Wine, 2 Fameuse, 2 Fulton, 2 Grimes's Golden; winter, 5 Dominie, 5 Jonathan, 5 Missouri Pippin, 10 Winesap, 10 Ben Davis, 30 Rawles Genet, 10 Willow Twig, 5 Gilpin.

List of varieties, and proportions of each, named in the order of profit, most reliable for a market orchard of 1,000 trees: 10 Early Pennock, 10 Red Astrachan, 10 Cooper's Early White, 10 Sops of Wine, 10 Maiden's Blush, 10 Lowell, 10 Gramar Pearmain, 10 Fulton, 20 Grimes's Golden, 25 Dominie, 25 Jonathan, 50 Missouri Pippin, 100 Winesap, 100 Ben Davis, 400 Rawles Genet, 100 Fink, 50 Willow Twig, 50 Gilpin.

SMALL FRUITS.

Date of first planting: Blackberry, currant and gooseberry, in 1870; raspberry, in 1868; strawberry, in 1865; by T. C. Henry, Judge Kilgore and 'Squire Barber, of Abilene.

Location preferable: Blackerry, upland; currant and gooseberry, upland, moist, and shaded; raspberry and strawberry, upland.

Soil most productive: Sandy, for all classes.

Preparation: Deep plowing.

Planting season: Early spring.

System: Blackberry, in rows 8 feet apart, and 3 feet in rows; gooseberry, the rows 6 feet apart, and 4 feet in the row; raspberry, rows 8 feet apart, 4 feet in row; strawberry, rows 3 feet apart, and 15 inches in row.

Cultivation necessary: Blackberry, gooseberry and raspberry, first year, frequent, with horse cultivator—mulch thereafter; currant, heavy mulch from the time of planting; strawberry, keep clean with cultivator and hoe, remove all runners as they form, mulch lightly in the fall, and in the spring draw it back into the space between rows.

Pruning: Blackberry, in summer, nip off the ends of cane in June, and the laterals in July; in winter, cut out the old wood of the previous year; gooseberry, in winter, thin out the old branches, to encourage young growth, and cut back long shoots; raspberry, treat the same.

List of varieties, in the order of value and productiveness: Blackberry, Kittatinny; gooseberry, Houghton; raspberry, Doolittle, McCormick, (syn. Mammoth Cluster); strawberry, Wilson's Albany.

The one variety which affords the most satisfactory results, in plant and product: All of the foregoing, except Doolittle raspberry.

Mulching has been an advantage in both winter and summer, and is indispensable.

Manuring of all classes is profitable, excepting the strawberry. Should be spread on the land in winter, and plowed under in spring. After the first year, only spread on the surface.

VINEYARDS.

Date of first planting: 1870, by T. C. Henry, of Abilene.

Location most desirable: Upland; second bottom does very well.

Soil most productive: Sandy loam.

Preparation necessary: Deep plowing and subsoil stirring would be an advantage for upland.

Planting: Distance, 8 feet by 8; mulch as soon as planted; strong one-year-old vines are most suitable.

Cultivation: Stir frequently with cultivator until the last of August.

Training and pruning: The spur and cane system combined, maintaining an annual supply of canes from the collar.

List of preferred varieties, in the order of success: For family use, Concord, Salem, Hartford Prolific; for market, Concord.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that of 1879: Apple, peach, blackberry, raspberry, 50 per cent.; pear, much less; cherry, gooseberry, strawberry, 20 per cent.

The present condition of horticulture, in the aggregate, is not very cheering; but is much better at the end of the past ten years than in many of the States east of this at fifteen years.

There is a general interest and confidence in the ultimate success of fruit growing with the people of this county, and sufficient encouragement for future investments.

DONIPHAN COUNTY.

BY S. HATCH, WATHENA.

ORCHARDS.

I cannot furnish the date of first planting in this county.

The experience of past years favor, as most desirable for fruit trees, a location with a northern exposure, or where protected from west and southwest winds.

Soil most productive: This county is composed largely of the bluffs of the Missouri river and its tributaries. The soil is very generally uniform, being a black loam, with a slight admixture of sand, making it light and friable. The subsoil is clay, underlaid with limestone. It proves to be excellently adapted to the growth of fruits of all kinds. The preference given is not so much as to soil as the location, which should be sufficiently rolling to afford ample drainage. The bottom lands of the river should be avoided, for the reason that, being largely composed of "gumbo" soil, they afford but slight if any drainage, which causes the roots to decay from the stagnant water around them.

Soil: Its preparation should be deep, by plowing and thorough pulverizing, for all classes of fruits.

Season for planting: Spring-time is preferable.

System for planting: In squares, trees 28 feet apart; pear and peach, 20 feet.

Cultivation: Shallow in early spring; allowing a crop of grass and weeds to grow during the latter part of the season for a winter protection of the ground; seed to clover as soon as cultivation is made difficult by the size of tree. This treatment applies to all classes of orchard trees.

Pruning: Apple, in April and until July, removing only such limbs as are crowding and chafing; pear, train to a pyramidal form. Other classes do not require any pruning, except to remove interfering limbs.

Wind-breaks, constructed on the southwest side, are beneficial. Cottonwood and willow trees have been successfully used for such purposes.

A list of varieties, in the order of their value, which have been productive — *For family purposes:* Apple — Early Harvest, Red Astrachan, Maiden's Blush, Rambo, Fameuse, Winesap, Rawles Genet, Jonathan, and Talman's Sweet. Pear — Bartlett, Duchess d'Angouleme, White Doyenne, and Buffum. Peach — Amsden's June, Crawford's Early, Crawford's Late, Early York, and Heath Cling. Plum — Wild Goose. Cherry — Early Richmond, English Morello, common Morello, and May Duke. *For market purposes:* Apple — Ben Davis, Missouri Pippin, Winesap, Rawles Genet, Rambo, Maiden's Blush, Red Astrachan, and Early Harvest. Pear — Bartlett, White Doyenne, Buffum, and Duchess d'Angouleme. Peach — Amsden's June, Crawford's Early, Crawford's Late, Early York, and Heath Cling. Plum — Wild Goose. Cherry — Early Richmond and English Morello.

List of varieties, and proportion of each, for a family orchard of 100 trees: Apple—Summer, 2 Early Harvest, 3 Red Astrachan, 2 Summer Rose, 2 American Summer Pearmain, 2 Golden Sweet; autumn, 4 Rambo, 3 Fameuse, 3 Maiden's Blush, 3 Ortley, 2 Belmont; winter, 15 Winesap, 15 Rawles Genet, 15 Missouri Pippin, 5 Ben Davis, 5 White Winter Pearmain, 5 Jonathan, 5 Talman's Sweet, 5 Willow Twig, 2 Yellow Bellflower, 2 Huntsman's Favorite.

List of varieties most reliable—proportions of each, named in the order of profit, for a market orchard of 1,000 trees: Apple—300 Ben Davis, 250 Winesap, 200 Missouri Pippin, 75 Rawles Genet, 50 Jonathan, 25 White Winter Pearmain, 20 Rambo, 10 Sops of Wine, 10 Maiden's Blush, 5 Fameuse, 5 Ortley, 20 Red Astrachan, 20 Carolina Red June, 10 Early Harvest.

SMALL FRUITS.

Location preferable: A northern exposure for all classes except the strawberry, which should be on a southeast or west.

Soil: Preparation—Blackberry and raspberry, deep plowing and thorough harrowing. The raspberry and strawberry require rich land.

Planting season—All classes in early spring.

System: Blackberries—Throw open furrows with a plow, 7 feet apart, and set the plants in them 3 feet apart; gooseberry, in rows 3 to 4 feet apart; raspberry, in rows 6 feet apart, and for blackcaps, 3 feet apart in the row; red varieties, 5 feet apart; strawberry, in rows 4 feet apart, and 15 inches in the row.

Cultivation: Clean culture or mulching, cutting down all sprouts. Raspberry, keep the ground level in their culture; strawberry, constant; mulch in the fall, allowing it to remain until fruit is gathered next year.

Pruning: Head back the canes when grown, to 3 or 3½ feet high, in summer. Raspberry, head back the canes when 2 to 2½ feet high.

A list of varieties reliably productive, in the order of value: Blackberry, Kittatinny and Snyder; currant, Red Dutch; raspberry—black varieties, Doolittle and McCormick; red, Turner and Thwack; strawberry, Wilson's Albany, Captain Jack, Crescent.

The one variety affording the most satisfactory results, in plant and product: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Houghton; raspberry, Doolittle; strawberry, Wilson's Albany.

Mulching has been an advantage to small fruits, in summer and winter.

Manuring has been profitable with raspberry and strawberry; should be liberally broadcast in spring and fall, and worked into the ground around the plants.

VINEYARDS.

Location: Eastern or southern exposure, open to free circulation of air.

Soil most productive: Slightly sandy, with porous subsoil.

Preparation: Deep plowing and thorough harrowing.

Distance for planting: 8 feet apart each way. Plants to be set should be two years old, if propagated by cuttings, and one year, if by layers.

Cultivation should be clean, shallow, and continued until July.

Training and pruning: Stakes or trellis are suitable; a combination of spur and renewal system, for pruning.

A preferred list, in the order of success: For family use, Concord, Martha, Hartford Prolific, Delaware; for market, Concord, Ives, Hartford Prolific.

MISCELLANEOUS NOTES.

The extent of planting in 1880 compared with 1879: About the same of all classes.

The present condition of horticulture is encouraging for extended investments in the future. There is a general interest and confidence in the pursuit among the people of this county.

ELLIS COUNTY.

BY MARTIN ALLEN, HAYS CITY.

ORCHARDS.

Date of first planting: All classes in 1873, except peach, which was in 1874, by Martin Allen, Hays City.

Date of first fruiting: Apple, peach and cherry, in 1878, plum, in 1879, on the farms of P. W. Smith and this reporter, at Hays City.

Time has not been of sufficient length to determine any facts relative to locations and most productive soils.

The preparation of land should be thorough and deep.

Planting: Should be done in early spring. Apple trees require 24 feet each way, or in rows 24 feet apart and 12 feet in the row. Cultivation, such as is required to produce a good crop of corn.

Prune all classes of trees so as to develop the growth on south and windward sides by shortening in heavy leading limbs on the opposite side. Remove all dead, feeble and chafing branches and succulent growth from the stem and collar.

Wind-breaks: Located on the south and west sides, are an advantage to the orchard and garden. Construct in rows 12 feet apart and 4 feet in row. Cultivate lightly with a turning-plow as often as is necessary to subdue weeds between the rows, and in rows use a hoe. The cottonwood, box elder, honey locust, Osage orange and elms have been successfully used.

SMALL FRUITS.

Date of first planting: All classes in 1873, except strawberries, which were planted in 1875, by Martin Allen, of Hays City. All classes failed, and so far small fruits have not succeeded. Still I am of the opinion that plowing the soil deep, or trenching it and mulching, and shading the plants when set, would very much relieve us of serious obstacles hindering a success.

VINEYARDS.

Date of first planting: All classes in 1874, which failed. That of 1875 and 1876 succeeded. These efforts were made by P. W. Smith and Martin Allen, of Hays City.

Would recommend planting the grape on high lands, where decaying rocks crop out.

Soil should be well prepared as for any other crop. Use young plants, one to two years, strongly grown.

Cultivation: To keep soil loose and kill the weeds. Train low, as over a pile of brush or corn stalks.

Very little was planted in 1880. That for 1879 failed largely from the dry season, poor condition of the stock when it reached here, and the lack of a proper knowledge of how and what to do, among the people.

FRANKLIN COUNTY.

BY DR. ISAIAH PILE, OTTAWA.

ORCHARDS.

Date of first planting of all classes of orchard fruits: In 1858, by M. Osborne and J. Black, of Peoria, and this reporter.

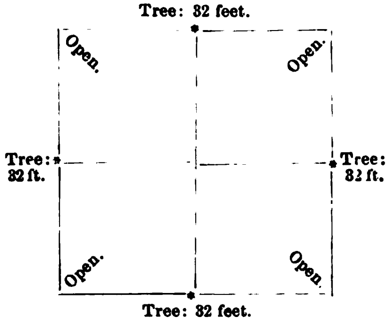
Most desirable location, determined by the past year's experience: For all classes, a high, rolling land.

Soil most productive: A clay loam, with limestone base.

Preparation of soil necessary, before planted: Thorough plowing and harrowing.

Planting: Preferred time, in autumn.

Method: For apples—Lay off the ground by plowing a deep furrow every 16 feet, and mark crosswise the same distance apart, (16 feet); then set the trees 32 feet apart in each row thus: (Note.—This is the quincunx form of planting. See diagram.—Sec'y.) In planting, commence with the first row; leave the first check in the row vacant, and set a tree at the second check; continue through the row, planting every other check; commence on the second row, set a tree at the first check, and alternate the checks throughout the row. The trees in the third row will be directly opposite to those in the first row, and 32 feet distant. Those in the fourth row will be opposite those in the second, and 32 feet distant. All the trees in the odd-numbered rows will correspond



with each other, and those in the even-numbered rows will correspond with each other. Pears and peaches, plant 24 feet apart each way; plum and cherry, 20 feet apart each way.

Cultivation: Should continue until the trees are seven or eight years old; then sow the ground to clover, blue-grass or orchard grass.

Pruning: Trim thoroughly while the trees are young, to secure an evenly-balanced, open top; do the work late in fall or early in spring.

List of varieties, in the order of their value, which have been productive in this county—*For family purposes:* Summer, Early Harvest, Carolina Red June, Red Astrachan, Early Pennock, American Summer Pearmain; autumn, Maiden's Blush, Rambo, Lowell, Fameuse, and Fall Wine; winter, Winesap, Ben Davis, Jonathan, Rawle's Genet, White Winter Pearmain, Missouri Pippin, Willow Twig, Rome Beauty, Gilpin, and Dominie. Peach—Crawford's Early, Hale's Early, Crawford's Late, Heath Cling, Large Early York, Stump the World, Amsden's June, and Old Mixon Free. Pear—Bartlett, Flemish Beauty, Duchesse d'Angouleme, Seckel, Louise Bonne de Jersey, Vicar of Winkfield, Buffum, White Doyenne, and Howell. Plum—Wild Goose, Miner, Chickasaw, Damson, Lombard, and Sand. Cherry—Early Richmond, common Morello, English Morello, May Duke, Governor Wood, and Belle Magnifique. Grapes—Concord, Ives, Dracut Amber, and Clinton.

Varieties preferred, and number of each to plant, in a family orchard of 100 trees: Apple—Summer, 10 trees, viz., Early Harvest, Carolina Red June, American Summer Pearmain, Red Astrachan, Early Pennock, and Cooper's Early White; autumn, 10 trees, viz., Maiden's Blush, Rambo, Lowell, Fameuse, Fall Wine, and Bailey's Sweet; winter, 80 trees, viz., Winesap, Missouri Pippin, Jonathan, Rawles Genet, White Winter Pearmain, Dominie, and Smith's Cider.

For a market orchard of 1,000 trees: 100 Winesap, 100 Ben Davis, 100 Jonathan, 100 Rawles Genet, 50 Gilpin, 100 Missouri Pippin, 100 Willow Twig, 50 Dominie, 50 Grimes's Golden, 25 Talman's Sweet, 100 Smith's Cider, and add for home market, 40 Maiden's Blush, 30 Lowell, 30 Fameuse, and 25 Fall Wine.

SMALL FRUITS.

Date of first planting: All classes, except strawberry and raspberry, in 1859, by Dr. I. Pile, Ottawa.

Location preferable: Highlands.

Soil most productive: Succeed on any good land.

Preparation of land: Thorough plowing and pulverizing.

Planting, preferred season: Early in spring.

Small fruits require thorough cultivation with plow and hoe.

Pruning: Blackberry and raspberry, cut out all old canes as soon as fruit is picked, and head back new canes, the first to 3 feet, and the raspberry some shorter.

List of varieties established as reliably productive, and named in the order of their value: Blackberry, Kittatinny, and Lawton; currant, Red *Dutch;* gooseberry, Houghton; raspberry, McCormick, Doolittle, Iron Clad, and Eagle; strawberry, Wilson's Albany, Col. Cheney, and Chas. Downing.

The one variety which affords the most satisfactory results in plant and fruit: Kittatinny blackberry, Red Dutch currant, Houghton gooseberry, McCormick (syn. Mammoth Cluster), Wilson's Albany strawberry.

Mulching has been an advantage to small fruits, both summer and winter.

Manuring of all classes has been profitable, applied in spring or winter as a surface dressing. Should be well rotted.

VINEYARDS.

A high, dry location and loamy soil produce the best results.

The preparation should be the same as recommended for small fruits.

Select one-year-old first-class plants, set in rows 8 feet apart and 6 feet in the rows.

The Concord and Dracut Amber are the most profitable varieties.

MISCELLANEOUS NOTES.

The extent of planting in 1880 was equal to that in 1879, of all classes.

The present condition of horticultural investments is favorable, and prospects fair for the future.

The results of past years are sufficiently satisfactory to warrant a moderate investment in fruit growing in the future. The interest and confidence of the people in this pursuit is quite general, and increasing.

GREENWOOD COUNTY.

BY ISAAC DETHERIDGE, FAME.

ORCHARDS.

Date of first planting: Apple, spring of 1867; pear, plum and cherry, spring 1870; peach, 1869, by W. B. Godfrey, Madison, and this reporter.

Date of first fruiting: Apple, plum and cherry, 1876; pear, 1880; peach, 1874, on the grounds of the above-named planters.

Location most desirable: Apple, pear and peach, eastern exposure.

Soil most productive: Gravelly, with well-drained subsoil, for all classes.

Land intended for orchards should be well subdued by two or three years' cultivation in crops, and put in fine tilth at time of planting.

Planting-time: Large apple orchards, both fall and spring; all others in spring.

Distances: Apple trees, 25 feet each way; peach, 15 feet in row, and rows 20 feet apart; plum, 15 feet each way; cherry, 12 to 15 feet each way.

Cultivation: Apple and peach—Keep clean as for a crop of corn until July 1st, and then cease, to allow the wood to mature for winter. Pear—Those least cultivated have been most successful. Plum and cherry—Mulch.

Pruning-time: Apple—During mild weather, the latter part of winter; remove succulent growth and chafing limbs, but at all times encourage a growth to shade the trunks. Pear—Very light. Peach—Cut back in spring about one-fourth of last season's growth. Plum and cherry trees—Same as pear trees.

Wind-breaks have been a great advantage to orchards and gardens, where located on the south and west sides; should be planted closely, in rows, and thin out as the growth requires in after years; cultivate the same as for corn. Box elder, cottonwood and peach trees are desirable for such purposes.

List of varieties of fruit which are productive, named in the order of their value, for family purposes: Apple—Red Astrachan, Carolina Red June, Early Harvest, Maiden's Blush, American Summer Pearmain, Lowell, Rambo, Jonathan, Ben Davis, Winesap, Rawles Genet, White Winter Pearmain, Missouri Pippin, Rome Beauty, Willow Twig, Limber Twig. Pear—Bartlett and Flemish Beauty. Peach—Alexander, Early Beatrice, Crawford's Early, Troth's Early Red, Hale's Early, Stump the World, Old Mixon Free, Heath Cling. Plum—Wild Goose. Cherry—Common Morello, Early Richmond.

SMALL FRUITS.

Varieties planted: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Houghton; strawberry, Wilson's Albany. Currants are most successful on the north side of a fence; the other classes succeed on most any kind of location having a deep, rich soil.

Cultivate as for a crop of corn; plant in the spring—blackberry, in rows 6 feet apart, and 2 feet in the row; currants, 5 feet, and 3 feet in the row; gooseberry, 6 feet apart, and 5 feet in the row; strawberry, 2½ feet, and 2 feet in the row. Cultivate thoroughly, or mulch heavily.

All of the foregoing varieties excepting the currant, have been productive and afford satisfactory results in plant and fruit.

Mulching has been an advantage to small fruits both in summer and winter. Gooseberry and strawberry should be manured, which should be applied during winter and worked into the soil in spring for the gooseberry, but left as a surface dressing with the strawberry.

VINEYARDS.

A southern exposure, having a light, dry gravelly soil, has been the most successful location and soil.

Preparation of the land before planting should be deep, by plowing.

Use one-year-old plants, set in rows 8 feet apart and 6 feet in the rows. Cultivate during the fore part of the season.

Train to wire trellises, and prune after the spur system.

The Concord has been the most successful variety.

The extent of planting in 1880 was an increase over that of 1878.

The present condition of horticultural investments is promising, on the uplands; that on the lowlands, somewhat doubtful.

HARVEY COUNTY.

BY MYRON HALL, NEWTON.

ORCHARDS.

Date of first planting: Apple and pear, spring of 1872; peach, plum and cherry, 1873, by Myron Hall, Newton.

Date of first fruiting: Peach, in 1877; plum, in 1876; cherry, in 1878; all on the farm of the above.

Location desirable: Apple, make the heaviest wood growth on high, rolling land; peach, the highest lands; plum, succeeds on any location; cherry, is tender anywhere tried.

Soil most productive: Apple, sandy loam; peach, dry, sandy loam; cherry, dry, sandy loam.

Preparation of soil: Deep and thorough tillage is required for all classes of orchard fruit.

Season for planting: Apple, pear and plum, fall or spring; peach and cherry, spring.

Method for planting, and distances: Apple — Remove bruised ends of roots cutting from the under side. Cut back one-third of last year's growth from the top. Set leaning to the southwest, in rows 25 feet each way, or 30 feet east and west, and 20 feet north and south. Pear — Treat same as the apple, but plant only 12 feet apart each way. Dwarfs should be planted deep, so as to encourage a growth of roots from above the union of bud and stock. Peach — Requires more top pruning when transplanted than any other class. Remove all side limbs, and set 15 feet apart each way. Plum — Set 10 feet distant from each other. Cherry — Smooth off bruised ends of roots; cut back the top as for apples. Set two inches deeper than in the nursery, and in rows 15 feet apart.

System of cultivation: Apple, frequently while young; peach, plum and cherry, same as for a corn crop.

Pruning, time and manner: Apple — March to June; all large wounds should be covered with grafting wax. Pear — In early spring. Peach — From January to October. Plum — Requires much pruning, and can be safely done at any time. Cherry — In early spring, opening out the centers.

Wind-breaks: Have been beneficial to apple orchards and gardens, when constructed on the north and south sides. The cottonwood, box elder, soft maple, Russian mulberry, silver-leafed poplar and Osage orange have been successfully used for such purposes. Should receive good cultivation.

A list of varieties, in the order of their value, which have been productive—*For family purposes:* Apple—Early Harvest, Cooper's Early White, Rambo, Rawles Genet, Missouri Pippin, Ben Davis, Winesap. Peach—Hale's Early, Crawford's Early, Crawford's Late, Heath Cling, and choice native seedlings. Plum—Wild Goose, Weaver, and choice native kinds. Cherry—Early Richmond, May Duke, English Morello, common black Morello. *For market purposes:* Apple—Early Harvest, Carolina Red June, Cooper's Early White, Maiden's Blush, Rambo, Red Astrachan, Missouri Pippin, Rawles Genet, Winesap, Ben Davis, Rome Beauty, Gilpin, Dominie, Jonathan, Willow Twig. Pear—Bartlett, Duchesse d'Angouleme, Clapp's Favorite, Louise Bonne de Jersey, Flemish Beauty, Vicar of Winkfield, Buffum, Osband's Summer. Peach—Crawford's Early, Crawford's Late, Amsden's June, Alexander, Heath Cling, Indian Blood Cling, Yellow Cling. Plum—Wild Goose, Weaver, and native sorts. Cherry—Early Richmond, May Duke, English Morello, common Morello.

Varieties and proportion of each for a family orchard of 100 trees: Apple—Summer, 5 Early Harvest, 5 Carolina Red June, 5 Early Ripe, 5 American Summer Pearmain, 5 Red Astrachan, 5 Cooper's Early White; autumn, 5 Rambo, 5 Maiden's Blush, 5 Fameuse, 5 Holland Pippin; winter, 10 Missouri Pippin, 10 Winesap, 10 Rawles Genet, 5 Ben Davis, 5 Rome Beauty, 5 Dominie, 5 Talman's Sweet.

Varieties most reliable, and proportions of each, named in the order of profit, for a market orchard of 1,000 trees: Apples—200 Missouri Pippin, 100 Rawles Genet, 100 Ben Davis, 100 Winesap, 100 Dominie, 100 Willow Twig, 100 Jonathan, 50 Rome Beauty, 50 White Winter Pearmain, 50 Gilpin, 50 Smith's Cider.

SMALL FRUITS.

Date of planting: All classes except currant, in the spring of 1873, by L. Cook, Newton.

Location preferable: Blackberry, northern slope; currant, any with shade on south side; gooseberry succeeds in any location; raspberry, high, rolling ground; strawberry not a success.

Soil most productive: Sandy loam; gooseberry and raspberry, on any kind.

Preparation of soil: Plow deep, and pulverize thoroughly.

Season for planting: Blackberry, autumn; currant and gooseberry, autumn or early spring; raspberry and strawberry, in early spring.

System for planting: Blackberry, in open furrows, 8 feet apart, with plow; set the plants in the furrow 3 to 4 feet apart, and fill in around them with hoe or shovel; plant the currant, gooseberry and raspberry in the same way.

Cultivation: By frequent use of a cultivator, and mulch the rows; currants, keep well mulched; gooseberry and raspberry require clean culture, and rows mulched.

Pruning: Blackberry and raspberry, cut canes back to 3 feet, in March.

A list of varieties reliably productive, in the order of value: Blackberry, Kittatinny; currant, Rocky Mountain; gooseberry, Houghton; raspberry, Smith and McCormick; strawberry, Wilson's Albany most promising.

Mulching has been an advantage to small fruits, in winter and summer.

Manure: All classes of small fruits are benefited by a top dressing of the ground with well-rotted manure, in the fall.

VINEYARDS.

Date of first planting: Fall of 1876, by S. A. Brown, Newton.

Location most desirable: Southeastern slope, protected on the south side.

Soil most productive: Deep, sandy loam.

Preparation of soil: Deep plowing, well pulverized.

Distance for planting: Eight feet apart each way. Well-rooted one-year-old layers are most suitable.

Cultivation: When the weeds start, commence running the cultivator. Keep the ground stirred and clear of weeds.

Training and pruning: Set posts in the rows north and south, 24 feet apart, run wires on the posts even distances from each other, fastening the lower one about 2 feet from the ground; to these wires train the canes. After the vines commence fruiting, in February of each year cut back all of the previous years' growth to two buds on each shoot, which are sufficient for fruiting.

List of varieties in the order of their success: For family use, Concord, Ives, Delaware, Martha, Elvira, Clinton, Hartford Prolific; for market, Concord, Ives, Delaware, Dracut Amber, Martha.

MISCELLANEOUS.

The extent of planting in 1880, compared with 1879: Apple, not as great, but better per cent. living; plum, blackberry, gooseberry, more, and cherry about equal; strawberry, less.

The present condition of horticultural investments is good, and is sufficient to warrant extended investments in the future. There is a general interest and confidence in the pursuit among our people.

JACKSON COUNTY.

BY W. D. BARNETT, HOLTON.

ORCHARDS.

Date of first planting: Apple and peach, April 5, 1855, by W. D. Barnett, Holton.

Date of first fruiting: Apple, in 1860; peach, in 1857; cherry, in 1859, on the farm of the above-mentioned planter.

Location preferable: Apple, a northwest slope; pear, peach, plum and cherry, on any except bottom lands.

Soil most productive: Limestone surface, with a clay underlying, formerly covered with forest trees, for all classes.

Preparation necessary: The land should be thoroughly and deeply plowed, and cultivated with a crop of some kind prior to planting; then deeply plowed, for all classes.

Planting: All classes should be planted in the spring, as soon as the land can be properly prepared.

Method and distances: Open holes sufficiently large, but no deeper than the ground has been plowed, to allow the roots of the trees to be spread out in natural position. Apples, set 30 feet; pear, 20 feet; peach, plum and cherry, 15 feet apart each way.

Cultivation: Apple and pear, in hoed crops the first five or six years; then sow to clover, mow it and allow it to remain on the land, as a mulch and manure; peach, plum and cherry should be cultivated each year, to produce the best results.

Pruning: Commence when the tree is young, form a low head, leaving branches at regular distances and sufficiently separated to avoid interference or chafing in the future. To stimulate the growth, prune when the tree is dormant.

Wind-breaks are an advantage, when not too dense.

List of varieties, in the order of their value and productiveness—*For family purposes:* Apple—Ben Davis, Winesap, Rawles Genet, White Winter Pearmain, Dominie, Maiden's Blush, Rambo, Fameuse, Carolina Red June, Keswick Codlin, Duchess of Oldenburgh, and Red Astrachan. Pear—Bartlett, Duchesse d'Angouleme, and Louise Bonne de Jersey. Peach—Crawford's Early, Amsden's June, Alexander, Large Early York, Crawford's Late, and Stump the World. Plum—Wild Goose, Damson, Green Gage, and Sand. Cherry—English Morello, Early Richmond, common Morello, and May Duke.

List of varieties and proportions of each preferred for a family orchard of 100 trees: Apple—Summer, 5 Carolina Red June, 3 Keswick Codlin, 2 Red Astrachan; autumn, 10 Maiden's Blush, 5 Rambo, 5 Fameuse; winter, 15 Winesap, 15 Ben Davis, 15 Rawles Genet, 10 White Winter Pearmain, 5 Talman's Sweet, 10 Dominie.

List of varieties most reliable, and number of each to plant, named in the order of profit for market orchard of 1,000 trees: 50 Carolina Red June, 30 Keswick Codlin, 20 Red Astrachan, 100 Maiden's Blush, 50 Rambo, 50 Fameuse, 150 Winesap, 150 Ben Davis, 150 Rawles Genet, 100 White Winter Pearmain, 50 Talman's Sweet, 100 Dominie.

SMALL FRUITS.

Date of first planting: All classes, in 1860, by W. D. Barnett, of Holton.

Location preferable: Blackberry, high land; currant, north and northwest slope; gooseberry, on all kinds; raspberry, southern; strawberry, southern and southeastern.

Soil most productive: The soil on which my fruits are planted and succeed is calcareous (limestone), based on clay and drift, which is underlaid with sandstone, solidified by filtration, I suppose. The ground was once covered with young timber.

Preparation necessary: About the same as is required for a crop of corn or potatoes.

Planting: Spring-time is preferred for all classes.

Cultivation necessary: Such as should be given to garden vegetables.

Pruning: Blackberry and raspberry, cut the canes at 4 feet in height, removing old and new canes, except three or four of the strongest of the latter; currant and gooseberry, cut out old and superfluous wood occasionally.

List of reliable varieties, in the order of value: Blackberry, Lawton and Kittatinny; currant, Red Dutch, White Dutch, White Grape; gooseberry, Houghton, Downing; raspberry, Doolittle, Miami, Turner; strawberry, the old reliable Wilson's Albany, Chas. Downing.

The one variety which affords the most satisfactory results in plant and fruit: Lawton blackberry, Red Dutch currant, Houghton gooseberry, black-cap raspberries, and Wilson's strawberry.

Mulching has been an advantage in summer and winter.

Manure (barn-yard) stimulates too much. Wood ashes scattered broadcast over the space between rows, and worked in, is beneficial.

VINEYARDS.

Date of first planting: Spring of 1858, by W. D. Barnett, of Holton.

Location most desirable: Southeast slope.

Soil most productive: Drift formation.

Preparation necessary: Deep plowing; and where not fertile, manure before planted.

Distance: Set in rows 8 feet apart, and rows 12 feet.

Cultivation: Young vines need cultivation, but old ones require only surface dressing.

Prune in warm days in latter part of winter (none in summer), to the long-arm system, and train to stakes or wire trellis; use one-year-old plants.

Concord is the only reliable variety of grapes for all purposes.

MISCELLANEOUS NOTES.

The extent of planting in 1880 compared with that for 1879, was much greater of all classes.

The present condition of horticultural investments is very fair. A majority of fruit growers seem to be satisfied with the results sufficiently to warrant extended efforts in the future. The interest and confidence in the pursuit is general with our people.

JEFFERSON COUNTY.

BY J. N. HALL, OSKALOOSA.

ORCHARDS.

Date of first planting: Apple, pear and cherry, in 1857; peach, in 1856; by C. A. Buck and W. L. Davis, Oskaloosa.

Date of first fruiting: Apple and pear, in 1862; peach, in 1858; cherry, in 1860, on the farms of the aforementioned planters.

Location most desirable: Apple, north or northeast slope, on high land; peach, highest northern slope; cherry, immaterial.

Soil most productive: Apple, red or commonly-called mulatto soil; peach, any that is fertile; cherry, immaterial.

Preparation: Well plowed.

Planting season: Spring.

Method and distances: Open good-sized holes; set the trees, and fill with mellow dirt; tramp it down firmly. Distance for apple, 25 feet; peach, 15 feet; cherry, 20 feet each way.

Cultivation: Plant to hoed crops, and cultivate from 1st of May to July 1st, for all classes except cherry.

Pruning: Remove small limbs at any time necessary—large limbs from November 20th to March 20th, and cover the wounds with paint. Prune lightly.

Wind-breaks, located on the north and south, have been an advantage. Construct in rows not less than 4 feet nor more than 8 feet each way, and cultivate until large enough to shade the land. Soft maple, walnut and cottonwood have been successfully used.

List of varieties, in the order of their value and productiveness—*For family purposes:* Apple—Early Harvest, Early Joe, Maiden's Blush, Jonathan, Rawles Genet, Winesap, Rambo, Milam. Cherry—Early Richmond and Black Morello. *For market purposes:* Apple—Jonathan, Ben Davis, Winesap, Rawles Genet, Missouri Pippin.

List of varieties and proportion of each for a family orchard of 100 trees: Apple—Summer, 2 Early Harvest, 2 Early Joe, 2 Hightop Sweet, 2 Carolina Red June; autumn, 3 Rambo, 3 Maiden's Blush; winter, 10 Jonathan, 10 Winesap, 10 Ben Davis, 10 Milam, 10 Rawles Genet, 10 Missouri Pippin, 20 White Winter Pearmain, 6 Baldwin.

For a market orchard of 1,000 trees: 200 Jonathan, 200 Ben Davis, 150 Winesap, 150 Rawles Genet, 200 Missouri Pippin, 80 Gilpin, 10 Early Joe, 10 Maiden's Blush.

Concord is the most desirable variety of grape.

The present condition of the horticultural industry in this county is fair.

The results of the past years warrant extended investments in the future. The interest and confidence in the pursuit are general.

JOHNSON COUNTY.

BY E. P. DEIHL, OLATHE.

ORCHARDS.

Date of first planting: Apple, in 1837; peach, pear, plum and cherry, in 1845; by Thos. Johnson, deceased, of Shawnee Mission.

Date of first fruiting: Apple, in 1845; pear, in 1850; peach, in 1844; plum, in 1848; cherry, in 1849—all from the above-named planting, now owned by Thos. Douglass.

Location most desirable: Apple, elevated, north or northeast slope. All other classes, elevated and well drained.

Soil most productive: Apple, clay limestone; pear, light limestone; peach, light sandy, well drained, rather poor; plum and cherry, limestone or black loam.

Preparation: Deep and thorough, by plowing and harrowing.

Planting: Apple and pear, in autumn; peach, plum and cherry, in spring.

Distances: Apple, in rows 30 feet apart, and 20 feet in the row; pear, in rows 18 feet apart, and 12 feet in row; peach, in rows 20 feet apart, and 16 feet in rows; plum and cherry, the rows should be 16 feet apart, and 12 feet in the row.

Pruning: Season, fore part of August is most desirable; if not done then, the latter part of February, when the trees are not frozen.

Wind-breaks, located on the south and west, are an advantage to orchards and gardens. Construct in rows from 6 to 10 feet apart, according to the habits of the trees used—whether close or spreading growth—and from 4 to 8 feet in the row. Thin out whenever the trees interfere with each other. Varieties successfully used, cottonwood, Osage orange, cherry, maple, and Lombardy poplar.

List of varieties which have been productive, named in the order of their value—*For family purposes:* Apple—Red Astrachan, Early Harvest, Large Yellow Bough, Early Ripe, Maiden's Blush, Fameuse, Holland Pippin, Winesap, Missouri Pippin, Rome Beauty, Rambo, Rawles Genet, Ben Davis, Wagener, Smokehouse, Smith's Cider. Pear—Bartlett, Flemish Beauty, Clapp's Favorite, Duchesse d'Angouleme, Osband's Summer, Beurre d'Anjou. Peach—Amsden's June, Early Beatrice, Early Louise, Early Rivers, Hale's Early, Crawford's Early, Troth's Early Red, Old Mixon Free, Old Mixon Cling, Yellow Rareripe, Crawford's Late, Bilyeu's Late, Heath Cling. Plum—Wild Goose, Miner, Chickasaw, Damson, Washington. Cherry—Early Richmond, English Morello, May Duke, Reine Hortense, Ohio Beauty. *For market purposes:* Apple—Early Harvest, Maiden's Blush, Holland Pippin, Rawles Genet, Missouri Pippin, Winesap, Smith's Cider, Wagener, York Imperial, Ben Davis. Pear—Bartlett, Flemish Beauty, Duchesse d'Angouleme, Clapp's

Favorite, Beurre d'Anjou. Peach—Amsden's June, Early Beatrice, Early Louise, Early Rivers, Hale's Early, Troth's Early Red, Crawford's Late, Morris's White, Heath Cling, Nanticoke, Bilyeu's Late. Plum—Wild Goose, Miner, Washington, Damson. Cherry—Early Richmond, English Morello, May Duke.

List of preferred varieties, and proportions of each to plant, in a family orchard of 100 trees: Apple—Summer, 3 Early Harvest, 2 Early Ripe, 3 Red Astrachan, 2 Carolina Red June; autumn, 5 Maiden's Blush, 5 Rambo, 5 Holland Pippin; winter, 10 Missouri Pippin, 10 Winesap, 10 Rawles Genet, 10 Rome Beauty, 10 Wagener, 5 Willow Twig, 5 York Imperial, 5 Flory's (Bellflower) Seedling, 5 Fallawater (syn. Tulpahocken).

List of varieties most reliable, proportions of each to plant, and named in the order of profit, for a market orchard of 1,000 trees: Apple—50 Early Harvest, 50 Maiden's Blush, 200 Ben Davis, 200 Missouri Pippin, 200 Winesap, 200 Rawles Genet, 50 Wagener, 50 York Imperial.

SMALL FRUITS.

Date of first planting: Blackberry, currant and raspberry, in 1860; gooseberry, in 1859; strawberry, in 1862.

Location preferable: All classes, northern, except the strawberry, which should have a south or southeast exposure.

Soil most productive: Blackberry and raspberry, clay and limestone; currant, clay; gooseberry, limestone; strawberry, sandy clay.

Preparation: Blackberry, deep tillage and well fertilized. The other classes require deep tillage.

Planting season: Early spring, for all classes.

System: Blackberry and raspberry, in rows 6 feet apart and 3 feet in the row; currant and gooseberry, 4 feet each way; strawberry, in rows 3 feet apart and 1½ feet in the row.

Cultivation: Thorough, in the spring before blooming.

Pruning: Blackberry and raspberry, pinch off the ends of the growing canes when three feet high, and shorten in the branches.

List of varieties reliably productive, in the order of their value: Blackberry, Kittatinny and Lawton; currant, Cherry; gooseberry, Houghton and Mountain; raspberry, Miami, McCormick, Gregg, and Thwack; strawberry, Wilson's Albany, Captain Jack, Crescent, and Cumberland Triumph.

The one variety affording the most satisfactory results, in plant and fruit: Blackberry, Kittatinny; currant, Cherry; gooseberry, Houghton; raspberry, Miami; strawberry, Wilson's Albany.

Mulching has been an advantage in summer and winter.

Manuring: All small fruits are benefited by a surface dressing in the spring, at the rate of ten wagon-loads per acre.

VINEYARDS.

Date of first planting: In 1868, by C. M. Ott, of Olathe.

Location most desirable: Eastern or northeastern.

Soil most productive: Well-drained sandy clay.

Preparation: Deep and thoroughly tilled; under-drainage has proven a great benefit.

Planting—manner preferred: Rows running north and south 10 feet apart, and 8 feet in the row. Strong one-year-old plants are preferable.

Cultivation: Should be thorough from April to July 1st.

Training and pruning: Train to three-wire trellis in fan system; prune lightly.

List of varieties, in the order of success, for family use: Concord and Martha.

MISCELLANEOUS NOTES.

The extent of planting in 1880, as compared with that in 1879: Apple, 10 per cent. less; cherry, blackberry, currant, gooseberry, 15 per cent. more; peaches, 10 per cent. less; strawberry, 15 per cent. more; pear, 60 per cent. less; raspberry, 20 per cent. more.

The present condition of the horticultural interest is encouraging, and the results of the past years will warrant extended investments in the future. There is a general interest and confidence in the pursuit among the people of this county.

BY H. PERLEY, SPRING HILL.

ORCHARDS.

Location most desirable: Apple—High rolling prairie, having a northern inclination. Pear—High and well-drained land seems to be uniformly the best. Peach—High lands with a northern inclination afford the finest results, as they retard the blooming period, rendering it safer, as to the ruinous effects of spring frosts. Plum trees succeed in various kinds of locations, but the fruit fails from attacks of the curculio. Cherry succeeds in most any location.

Soil most productive: Black prairie land is as good as any in the county. Pear—Success cannot be traced to differences in soil. Such as produces a rather slow growth, and well matures it, affords the best results. Natural or artificial drainage is necessary. Peach—Success does not depend on any particular kind of soil, but on that intelligent care and unceasing vigilance required—but which very few practice. Plum trees succeed on common soil. Destroy the curculio, or "head it off," and an abundance of the finest of fruit would be produced. Cherry—The Early Richmond and common Morello succeed on any soil common in this county.

Preparation: Deep plowing and thorough pulverizing with harrow. Trench plowing is recommended. Such preparation applies to all classes of orchard fruits.

Planting season: For apple and pear, autumn—or in February, if the ground can be properly prepared. Spring is the best for peach, plum, and cherry.

Distances: Apple, 28 feet each way; pear, standard trees 16, and dwarfs 10 or 12 feet, each way; peach, 20 feet; plum, 12 to 16 feet.

System: Open holes three feet in breadth and two feet deep; having cut off all the bruised ends of roots, cutting from the under side, place the tree, and fill in carefully with fine earth around its roots; press it down firmly, to hold the tree in position, which should be considerably inclined to the southwest. They should not be set any deeper than when in the nursery.

Cultivation: Such as is required to produce a good crop of corn, which is the best crop to grow in an orchard. It affords protection against the sun and wind, so much desired during the growing season, cultivation ceasing with the "laying by," being generally at the time when the condition of the trees requires it. The protection it affords is more desirable than that obtained by close planting, with the intention of removing alternate trees in after years, to prevent interference.

Pruning: Apple—The tree should be properly shaped before planted, by removing all superfluous branches, and cutting back those left to form a head. During the growing season, carefully watch and cut out all shoots which if left would intersect or produce too dense a head, or destroy its symmetrical form. In cases where neglect causes the removal of large limbs, do the work in the latter part of winter. Small limbs can be safely cut out in the middle of summer, and will heal more quickly than when done at any other time. Avoid all pruning when there is a vigorous upward flow of the sap, as there will be danger of an injury by bleeding. Pear—Only to remove chafing limbs. Peach—Low and wide-spreading heads are most desirable for beauty of form, productiveness, and ease in gathering the fruit. To secure such a result, cut back from one-third to one-half of the past year's growth, in February of each year, leaving the bud cut to on the outer side of the branch. Plum—Does not require much pruning. Sometimes the shortening in of the limbs (recommended for peach trees) becomes an advantage with varieties of the plum. Cherry—Requires only such as is needed to prevent chafing by intersecting limbs.

Wind-breaks: Most of our successful orchardists consider such shelters an advantage, when located on the south and west sides of an orchard and garden. If constructed of Norway spruce, Scotch pine or red cedar, a single row is sufficient, in which the trees should be from 6 to 8 feet apart. If of black walnut, two rows, 8 feet apart and 6 feet in the rows, will be necessary. An Osage orange hedge is considered as one of the best forms for a shelter. Soft maple is being discarded for such purposes. The black walnut has been charged as being injurious to fruit trees or evergreens when planted near them. This objection has not been sustained in this locality. Wind-breaks should receive the same cultivation as given to the orchard.

List of varieties of fruit which have been productive, named in the order of their value—*For family purposes:* Apple*—Summer, the Early Harvest (shy bearer), Hightop Sweet (productive and not excelled for baking), Carolina Red June (does well and is a favorite dessert variety), Red Astrachan (shy, and too tart), Early Pennock (succeeds), Trenton Early (one of the best); autumn, Maiden's Blush, Fameuse, Holland Pippin, Fall Winesap, and Rambo; winter — the past season has put the Winesap far ahead of all other varieties. Ben Davis holds a prominent place. Jonathan the best in its season. Rawles Genet, Smith's Cider, Roman Stem. The Missouri Pippin is profitable. Pear — Bartlett, Flemish Beauty, (as dwarfs;) this applies to the varieties following: Louise Bonne de Jersey and Duchesse d'Angouleme succeed. Peach — Hale's Early, Amsden's June, Alexander, Brice (a promising new early variety), Large Early York, Crawford's Early, Crawford's Late, and Heath Cling. Plum — But little inducements can be offered to farmers in this county to invest much in plum culture with the expectation of realizing satisfactory returns. Cherry — The common Morello is the best for family purposes; the tree has the most serious objection of interminably sprouting from the roots; Early Richmond succeeds. *For market purposes:* Winesap, Ben Davis, Missouri Pippin, Rawles Genet, Smith's Cider, Jonathan, Willow Twig. (NOTE.—Too many of the early and fall varieties are planted in the orchards of this county. The home market is small, and it seldom pays to ship such varieties.) Pear — Cannot offer any recommend for their culture as a market fruit. Peach — Hale's Early, Amsden's June, Alexander, Large Early York, Crawford's Late, Heath Cling, and Bergen's Yellow. Cherry — Early Richmond.

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* There is a great need of a better earlier variety than is now in cultivation.

List of preferred varieties, and proportions of each, for a family orchard of 100 trees: Apple — Summer, 3 each Early Harvest, Carolina Red June, Hightop Sweet, Trenton Early, Early Pennock; autumn, 3 each Maiden's Blush, Rambo, Lowell, Fameuse, Holland Pippin; winter, 15 Winesap, 10 Jonathan, 10 Rawles Genet, 10 Roman Stem, 10 Smith's Cider, 5 Rome Beauty, 5 Missouri Pippin, 5 White Winter Pearmain.

For a market orchard of 1,000 trees, number of each variety, named in the order of their profit: Apple — 250 Winesap, 200 Ben Davis, 200 Missouri Pippin, 150 Rawles Genet, 100 Smith's Cider, 50 Jonathan, 50 Willow Twig.

SMALL FRUITS.

Location preferable: Northern slope, for all classes.

Soil most productive: Common black prairie loam.

Preparation necessary: Thorough plowing and harrowing, and manure such soils as are not rich.

Planting-time: In spring, for all classes.

System: Blackberry and raspberry, in rows 6 feet apart, and plants 4 feet in the row; gooseberry, 4 feet each way; strawberry, in rows 4 feet, and one foot apart in the row.

Cultivation: Blackberry and raspberry, keep down shoots between rows, and clear of all weeds; currant, mulch; gooseberry, clean culture.

Pruning: Blackberry, cut back canes to 3 feet high, and remove all old wood just after fruiting; raspberry, cut back canes to 2 or 2½ feet high.

List of varieties reliably productive, named in the order of their value: Blackberry, Kittatinny, Lawton, Missouri Mammoth; currant, Red Dutch, White Dutch; gooseberry, Houghton; raspberry, all varieties of blackcaps; strawberry, Wilson's Albany.

The one variety which affords the most satisfactory results in plant and fruit: Kittatinny blackberry, Red Dutch currant, Houghton gooseberry, Miami raspberry, Wilson's strawberry.

Mulching has been an advantage in winter, especially for strawberries, and in summer for currants.

Manure is profitable on old worn-out soils; should be applied broadcast in the spring, and worked into the land with plow and harrow.

VINEYARDS.

Location or soil have produced very little difference in results, so far.

Preparation of the soil should be thorough, and on thin soils, use manure.

One-year-old vines should be used. Plant in rows running north and south, 6 feet apart.

Train to trellis, and keep clean by cultivation.

The Concord and Dracut Amber are the most successful varieties.

MISCELLANEOUS NOTES.

The extent of planting in 1880, of apple and peach, was greater than in 1879; cannot report as to other classes.

The present condition of horticultural investments is good, wherever intelligent care and constant vigilance have been exercised.

KINGMAN COUNTY.

BY L. W. LEACH, KINGMAN.

ORCHARDS.

Date of first planting: All classes in 1877, by A. D. Culver, of Kingman.

Location: A northern slope is considered preferable for all classes, on account of its tendency to delay the development of buds early in spring.

Soil—preparation necessary: Deep plowing and thorough pulverizing before planting.

Planting season: Spring, for all classes.

Distances: Apple, 20 to 22 feet each way, in exposed locations; pear, standards 18 feet, dwarfs 12 feet; peach and cherry, 16 feet; plum, 14 feet.

Cultivation: Clean, level culture with cultivator, from the time the weeds start in the spring, until August 1st.

Pruning: Apple, should be done while trees are young, in February and

March, only removing surplus and interfering limbs. Summer-prune old trees to induce fruitfulness; pear and plum, lightly; peach, in the fall, shorten in the season's growth; cherry, lightly in spring.

Wind-breaks are considered of great advantage located on the south, north, and west. Construct in rows 6 feet apart, and 4 feet in the row. Cultivate well until the trees shade the land sufficiently to smother the weeds. Cottonwood and gray willow are considered the best for such purposes.

SMALL FRUITS.

Date of first planting: Blackberry and raspberry, in 1878, by this reporter, at Kingman.

Location preferable: Succeed on most any kind.

Soil most productive: Black sandy.

Preparation: Well plowed and pulverized.

Planting season: Autumn, and mulch at once.

System: Blackberry, in rows 8 feet apart, and 3 feet in rows; raspberry, in rows 6 feet apart, and 3 feet in rows.

Cultivation: Blackberry and raspberry, shallow and frequent, to keep weeds down.

Pruning: Blackberry—Cut off the ends of growing canes at 3 or 3½ feet from the ground, and shorten in the lateral growth. Raspberry—Cut off ends of growing canes at 2 feet high, and lateral growth at one foot from stalk.

The Kittatinny blackberry and McCormick and Doolittle raspberry are reliably productive, and afford satisfactory results in plant and fruit.

Mulching has been an advantage in summer and winter.

VINEYARDS.

Date of first planting, in 1877, by John Jackson, of Brighton.

MISCELLANEOUS NOTES.

This county is quite new, and the settlers have had a hard struggle to make a living, and consequently but few invest their capital in horticultural directions. I believe that careful investments will pay in time.

LABETTE COUNTY.

BY J. L. WILLIAMS, OSWEGO.

ORCHARDS.

Date of first planting: Apple, in 1866, by J. Zenk; pear, in 1877, by D. W. Claver; peaches, before settlement by the whites; plum and cherry, in 1867, by John Richardson, Oswego.

Date of first fruiting: Apple and plum, in 1870; pear and cherry, in 1871; peach in 1866, on the farms of John Richardson and D. W. Claver, The most desirable location for all classes of orchards and fruits: A northern slope.

Soil: Most classes require the same preparation as for a crop of corn.

Season to plant: Both spring and fall have resulted equally favorable.

Distances to plant: Apple, 24 by 24 feet; peach 18 by 18 feet; plum, cherry and pear, 16 by 16 feet.

Cultivation of a bearing orchard: Plow and harrow frequently during summer.

Pruning: Should be light and during June or early July, excepting the cherry, which should be in early spring.

Wind-breaks: Located on the south and west, constructed in rows 6 to 10 feet each way, have been an advantage to orchards and gardens. They should be cultivated for a few years during the growing season, the same as a corn crop.

List of varieties of fruit in the order of their value and productiveness—*For family purposes:* Apple—Winesap, Maiden's Blush, Red Astrachan, Jonathan, Carolina Red June, Cooper's Early White, White Winter Pearmain, Rome Beauty, Fall Wine, Willow Twig. Pear—Bartlett, Duchesse d'Angouleme, Louise Bonne de Jersey, Clapp's Favorite. Peach—Hale's Early, Crawford's Early, Stump the World, Old Mixon, Crawford's Late. Plum—Wild Goose, Miner, Chickasaw. Cherry—Early Richmond, May Duke, Belle Magnifique, English Morello. *For market purposes:* Apple—Ben Davis, Winesap, Willow Twig. Pear—Bartlett. Peach—Hale's Early, Amsden's June, Alexander, Stump the World, Crawford's Early. Plum—Wild Goose. Cherry—Early Richmond.

Preferred varieties, and proportion of each, for a family orchard of apples of 100 trees: Summer, 3 Carolina Red June, 3 Early Harvest, 3 Red Astrachan, 3 Early Pennock, 3 Cooper's Early White; autumn, 4 Maiden's Blush, 4 Rambo, 4 Fall Pippin, 4 Fall Wine, 4 Fameuse; winter, 10 Winesap, 10 Ben Davis, 10 Rawles Genet, 5 Willow Twig, 5 Jonathan, 5 Missouri Pippin, 5 White Winter Pearmain, 10 Rome Beauty.

Most reliable varieties of apples, named in the order of profit, and the proportion of each, for an orchard of 1,000 trees: 750 Ben Davis, 250 Winesap.

SMALL FRUITS.

Date of first planting, of all classes, in 1870, by J. L. Williams and others.

Preferable location: Southern slope.

Soil: Any rich soil is productive and suitable, and should be well prepared by thorough tilling before planted.

Time for planting: Either autumn or spring.

Cultivation: Should be same as for corn.

Pruning: Blackberry, cut back one-third the year's growth; gooseberry, trim out the old wood, when thick; raspberry, cut back one-half the year's growth.

List of varieties established as reliably productive, in the order of their respective value: Blackberry, Kittatinny, Lawton; currant, Red Dutch; gooseberry, Houghton; raspberry, McCormick (syn. Mammoth Cluster), Doolittle, Turner; strawberry, Wilson's Albany, Chas. Downing.

The one variety most satisfactory in plant and productiveness: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Houghton; raspberry, McCormick; strawberry, Wilson's Albany.

Mulching has been advantageous to all classes in winter. Cultivation is preferable in summer. Manure scattered broadcast over the land, five to twenty wagon-loads to the acre, late in autumn or early spring, is beneficial to all classes.

VINEYARDS.

Date of first planting: In 1869, by W. Doudna, Chetopa.

Most desirable location: A southern slope.

Soil most productive: Rocky bluffs.

Planting: After the land is well plowed and pulverized, dig holes sufficiently large to receive the roots well spread out, in rows 8 to 10 feet each way. One-year-old plants are most suitable.

Constant cultivation during the growing season is necessary. Train to stakes, and prune lightly.

The Concord is the most desirable variety for family and market purposes.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that of 1879, of all classes, was about the same, with the exception of the pear and strawberry, which was 50 per cent. more.

The present condition of horticultural investments is fine, and the people are satisfied with the future prospects. The results, so far, warrant extended investments in the future. The interest and confidence in the horticultural pursuit are general among the people of this county.

LEAVENWORTH COUNTY.

BY E. J. HOLMAN, LEAVENWORTH.

ORCHARDS.

The experiences of past years would indicate as a preferable location, a northwestern slope for apple and pear orchards; for the peach and plum, the higher the better. A north or western exposure frequently enables the trees to mature their wood better; also, such locations frequently escape late spring frosts. Cherry trees grow on most any location, but a northern or northwestern will have a tendency to retard the bloom in spring, which is frequently an advantage in their escaping spring frosts.

Soil most productive: Apple, sandy loam, shaley and gravelly, a soil in its nature open and loose, capable of absorbing everything, and having a good subsoil-drainage. Pear—Does the best where a deep, rich, clay subsoil abounds; a forest clearing furnishes the most successful soil. Peach—Most any of our Kansas soil is good enough; location is of more importance in peach culture than the character of soil, though an exhausted soil should be enriched. Plum—A sandy, loose soil is desirable, as the roots run near the surface of the ground; a clay or soil inclined to bake, would be ruinous. Cherry—A sandy or clay loam, is desirable.

Preparation of soil necessary before planting: Apple—If not already in good tilth, manure broadcast, and thoroughly plow ten or twelve inches deep. If the subsoil is of a stiff clay, and so near the surface as to prevent deep plowing, then follow with a subsoil plow, especially all the furrows between and up to within 6 feet of the line where the rows of trees are to be planted. Pear—For standards, deep and thorough working; dwarfs do not require such depth. For pears the land requires no manuring. Peach—Thoroughly plowed 7 or 8 inches deep, is sufficient for an average fertile soil. This applies also to plums. Cherry—The land should be well broken 9 or 10 inches deep, and thoroughly harrowed, and pulverized with a clod-crusher; then use the heavy plow to open a furrow where the trees are to be planted.

Planting: The spring is preferable for all classes.

Distance: Plant apple trees forty feet apart each way, and alternate in the rows with other classes of fruit trees. Pear, standards, 30 feet; dwarfs, 15 feet; if they are to be grown into standards, 25 feet each way. Peach, 20 feet. Plum, the Wild Goose, 25; other varieties, 20 feet; cherry, 25 feet each way.

Cultivation: Keep the ground constantly stirred from spring to August 1st. A five-tooth garden cultivator is one of the best implements. A crop of potatoes or vine truck can be safely grown between the trees.

Pruning: Apple—In March, or during mild weather in February. Remove deformed, diseased and interlacing parts of the branches. Keep the bodies freed from sprouts. Pear—Same as for the apple, with the addition of heading back the upright, strong growth which some varieties are naturally inclined to form. Peach—Prune in March, by shortening in. An amount of small inside growth needs to be removed each year. Strong, stocky-growing varieties do not require such treatment. Plum—Remove all unhealthy, dead and crossing or chafing limbs, in the spring. Cherry—Remove small inside limbs and chafing branches.

Wind-breaks have been an advantage to orchards and gardens. There are not many artificial shelter-belts in this county. Most of the protection is derived from the native forests.

List of varieties of fruits which have been productive, named in the order of their value—*For family purposes:* Apple—Rawles Genet, Jonathan, Winsap, Willow Twig, White Winter Pearmain, Milam, Rambo, Maiden's Blush, Porter, Jefferis, Sops of Wine, Early Joe, Sweet Bellflower, Lowell, Early Pennock, Carolina Red June. Pear—Duchesse d'Angouleme, Bartlett, Seckel, Vicar of Winkfield. Peach — Alexander, Early Louise, Hale's Early, Coolidge's Favorite, Old Mixon Free, Ward's Late Free, Smock, Heath Cling, Jacques Rareripe. Plum — Wild Goose, Lombard, Green Gage, German Prune, Yellow Egg, Huling's Superb. Cherry — Early Richmond, English Morello, May Duke, Reine Hortense, Napoleon Bigarreau. *For market purposes:* Apple — Ben Davis, Rawles Genet, Winesap, Willow Twig, Jonathan, Maiden's Blush, Cooper's Early White, Carolina Red June, Striped June, Early Pennock, Sops of Wine, Wagener, Gilpin, Smith's Cider. Pear — Bartlett, Duchesse d'Angouleme, Howell, Flemish Beauty, Louise Bonne de Jersey, White Doyenne, Vicar of Winkfield. Peach — Alexander, Amsden's June, Early Beatrice, Early Rivers, Early Louise, Hale's Early, Large Early York, Coolidge's Favorite, Old Mixon Free, Ward's Late Free, Heath Cling, Smock, LaGrange, Deming's September. Plum — Wild Goose, Lombard, Green Gage. Cherry — Early Richmond, English Morello.

List of varieties, proportions of each to be planted in an orchard of 100 treees, for family use: Apple — Summer, 2 each of Early Harvest, Carolina Red June, Early Joe, Sops of Wine, Early Pennock, and Hightop Sweet; autumn, 5 Maiden's Blush, 2 Porter, 1 Lowell, 1 Jefferis, 1 Sweet Bellflower, 1 Primate, 10 Jonathan, 1 Rambo; winter, 20 Rawles Genet, 10 Ben Davis, 5 Winesap, 5 Willow Twig, 1 Wagener, 2 Fameuse, 2 Milam, 1 Hubbardston Nonsuch, 5 Minkler, 5 Roman Stem, 2 White Winter Pearmain, 2 Gilpin, 1 Limber Twig and 1 Lady Apple.

For a market orchard of 1,000 trees, named in the order of profit, and proportions of each to plant: Apple — 380 Ben Bavis, 200 Rawles Genet, 100 Jonathan, 100 Winesap, 75 Willow Twig, 20 Townsend, 20 Sops of Wine, 50 Maiden's Blush, 25 Cooper's Early White, 10 Carolina Red June, 20 Early Pennock.

SMALL FRUITS.

Location preferable: Blackberry, any well drained; currant, a shady one; gooseberry, partially shaded; raspberry, any kind is partial to shade; strawberry, all locations.. Difference in the season for ripening decides the location.

Soil most productive: Blackberry, sandy, gravelly loam; currant and gooseberry, sandy loam; raspberry, any fertile, open soil; strawberry, deep sandy loam, and least disposed to heave by freezing.

Preparation necessary: Deeply plowed, as early in spring as possible, and pulverized with harrow. Land designed for the raspberry and strawberry, if any way sterile, should be strengthened with fertilizers, spread broadcast, and worked in with plow and harrow.

Planting season: In spring, for all classes.

System: Blackberry, in rows 10 feet apart, and 2 feet in the row; currants, in rows 4 feet, and 3 feet in row; gooseberry, in rows 5 feet apart, and 3 feet in the row; raspberry, blackcaps, in rows 7 feet apart, and 2 feet in the row; red varieties, in rows 5 feet apart, and 1 foot in the row; strawberry, slow-runners, as Wilson's Albany, in rows 4 feet apart, by 1 foot in the row; other varieties, of rapid growth in runners, in rows 5 feet apart, and 1½ feet in the row.

Cultivation necessary: Such as will keep down weeds, and soil mellow.

Pruning: Blackberry, clip off the ends of canes in latter part of June or fore part of July, to 3 or 4 feet high, and shorten the lateral growth the following March, according to vigor of cane, from 6 to 18 inches; currant, thin out old wood, and shorten in the new; gooseberry, trim to miniature trees, with bodies 9 inches long; raspberry, trim blackcaps same as blackberries; red varieties, cut in the canes in spring to 3 feet in height, and remove weakly plants.

List of varieties reliably productive, named in the order of their value: Blackberry, Kittatinny, Dorchester, and Snyder; currant, Red Dutch, White Grape, and Cherry; gooseberry, Houghton; raspberry, McCormick, Doolittle, Gregg, Brandywine, Turner, Norwood; strawberry, Chas. Downing, Downer's Prolific, Captain Jack, Crescent, Cumberland Triumph.

The one variety affording satisfactory results in plant and fruit: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Houghton; raspberry, McCormick; strawberry, Chas. Downing.

Mulching has been an advantage in winter and summer.

Manuring is profitable for all classes of small fruits, and especially so on land which has been before occupied by any one of the classes. In the preparation of land for planting, it should be applied at the rate of twenty to forty cords per acre, and after one season's growth of plants, apply it broadcast, scattering close around the plants.

VINEYARDS.

Location most desirable: Hillside.

Soil most productive: Porous.

Preparation: Deep plowing and thoroughly pulverized.

Planting: In rows, 7 feet apart each way, using one-year-old plants.

Train on trellis, and prune to spurs of from one to three buds.

Cultivation necessary: Stir the ground each season until they commence to fruit, and mulch thereafter.

Varieties, in the order of their success, preferred for family use: Concord, Martha, Delaware; for market, Concord, Ives, Hartford Prolific, and Dracut Amber.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that of 1879: Apple, pear, peach, plum, cherry, currant, gooseberry, equal; raspberry and blackberry, much less; strawberry, greater.

The present condition of the horticultural investment is satisfactory, and very promising for the future, and affords encouragement for further efforts in the pursuit. The interest and confidence in fruit growing are general among the people.

BY F. WELLHOUSE, FAIRMOUNT.

ORCHARDS.

Date of first planting: All classes of orchard fruits, in 1855, by James Bosley, of Leavenworth.

Date of first fruiting: Apple and cherry, in 1861; pear, in 1862; peach, in 1859, on the farm of the aforementioned planter, near Leavenworth.

The experiences of the past years lead to the selection of high, moderately rolling prairie, as the most successful location for all classes of fruit trees.

Soil most productive: Moderately rich prairie, having a red-clay subsoil, resting on a limestone base.

Its preparation: If wild land, break it up as for grain crops, and cultivate one or two years before planting. Plant trees in the spring, as the safest time; set in rows running north and south, 12 feet apart, and the rows 32 feet apart.

Cultivate in corn the first five years; after that, sow to clover.

But little pruning is required, if done at the right time, and when the trees are young remove all water sprouts, dead and diseased limbs, in the spring. In pruning, remember that the body and large limbs need shade during the hot days in summer; therefore, avoid making openings which will cause an exposure.

Wind-breaks: Have not been able to discover any material benefits afforded by timber-belts to the orchards in this county. In some instances, where planted too close, they have been injurious. If used, they should be constructed on the northwest side of grounds intended to be protected, and in rows 10 to 15 apart and 6 to 8 feet in the rows, cultivated four or five years.

List of varieties of fruits, given in the order of their value and productiveness: *For family purposes:* Apple—Early Harvest, Carolina Red June, Red Astrachan, Cooper's Early White, Lowell, Maiden's Blush, Fameuse, Jonathan, Rome Beauty, Rawles Genet, Missouri Pippin, Winesap, Ben Davis, Willow Twig, Gilpin, Smith's Cider, White Winter Pearmain, Milam, Rambo, Porter, Jefferis, Sops of Wine, Early Joe, Sweet Bellflower, and Early Pennock. Pear—Bartlett, Seckel, Flemish Beauty, Vicar of Winkfield, White Doyenne, Duchesse d'Angouleme. Peach—Amsden's June, Alexander, Hale's Early, Old Mixon Free, Heath Cling. Plum—Wild Goose. Cherry—Early Richmond, English Morello. *For market purposes:* Apple—Cooper's Early White, Maiden's Blush, Jonathan, Rawles Genet, Missouri Pippin, Winesap, Ben Davis, Gilpin, Smith's Cider, Willow Twig. Pear—Bartlett, Vicar of Winkfield, Flemish Beauty, White Doyenne. Peach—Amsden's June, Alexander, Heath Cling. Plum—Wild Goose. Cherry—Early Richmond.

SMALL FRUITS.

Should be planted in spring. The preferred varieties are the Kittatinny blackberry, Red and White Dutch currant, Houghton and Pale Red gooseberry, Doolittle raspberry, Wilson and Chas. Downing strawberry.

The results of the past years are sufficiently satisfactory to warrant extended investments in fruit-growing, and the interest is general among the masses of the people.

LINCOLN COUNTY.

BY JACOB WEIDMAN, PLEASANT VALLEY.

ORCHARDS.

Date of first successful planting: Apple and pear, in 1875; peach, in 1872; plum and cherry, in 1876; by Oliver Goff and Mr. Angell, of Lincoln.

Date of first fruiting: Apple and pear, too young; peach, heavy in 1878; plum and cherry, in 1879.

Location most desirable: Apple, plum and pear, bottom land, if protected by timber from the south and southwest winds; peach, second-bottom land; cherry, Morello succeeds on most any kind.

Preparation necessary: The land must be deeply plowed, and requires no manure.

Planting—distances: Apple, in quincunx, 27 feet apart each way; pear, standards 20, and dwarfs 12 feet each way; peach, 15 feet; plum, 12 feet, and cherry 18 feet each way.

Cultivation: Apple and pear, plant to corn and give it clean culture; peach, plum and cherry, plant to hoed crops during the first three or four years after trees are set; cultivate in fore part of summer.

Pruning should be done while the trees are young, and between July 1st and September 1st. Pear requires light pruning; peach, form a head two feet from the ground, remove all shoots and leave no forks; plum and cherry, remove only water sprouts.

Wind-breaks, located on the south and southwest, are a great advantage. Cottonwood, box elder, ash, white and red elm, and seedling peach trees are well adapted for the purpose. Should be cultivated same as a fruit orchard.

Of orchard fruits, the peach, plum and cherry only, have come into bearing. Of peaches, the Alexander, Amsden's June, Hale's Early, Crawford's Early and Late, and Old Mixon, are productive; plums, Wild Goose and cultivated native varieties; cherries, common Morello, English Morello and the Early Richmond.

SMALL FRUITS.

Date of first planting: All classes in the spring of 1876.

Location most desirable: All classes need sheltered places, and the currant shade, to succeed.

Soil most productive: Rich land for all classes.

Preparation: Deep plowing and pulverizing.

Planting season: Currant, in early spring, and other classes in fall or early pring. The cultivation should be thorough, and all weeds kept under.

Pruning: Blackberry and raspberry, remove old wood, and cut off one-half the length of the previous year's wood growth.

List of varieties reliably productive, named in the order of their value: Blackberry, Kittatinny; gooseberry, Houghton; raspberry, Turner; strawberry, Wilson's Albany.

Mulching in winter is necessary with the strawberry.

VINEYARDS.

Date of first planting: In 1876, by this reporter, at Pleasant Valley.

Location most desirable: Second bottom, with a southeastern exposure.

Soil most productive: Sandy loam, with a sandy subsoil.

Preparation necessary: Stir with a surface and subsoil plow to the depth of 16 or 20 inches.

Planting: If ground is not too dry, set in the fall, in rows 7 feet apart, and 6 feet in the row.

Cultivation: Should be constant and thorough until the fruit begins to color. One-year-old layers, or two-year-old plants from cuttings, are preferable.

Training and pruning: Train to lath trellis in this windy country, and prune from the time the leaves drop until March 1st.

List of varieties, in the order of success—*For family use:* Triumph, Martha Seedling. Elvira, Noah, Teal, Louisiana, Martha. *For market:* Concord, Perkins, Ives, Goethe, Catawba, Hartford Prolific.

MISCELLANEOUS NOTES.

The extent of planting in 1880 compared with that of 1879, was greater.

The present condition of trees and small fruits is very good where they have been properly cared for.

The results of the past year are very encouraging, and a general interest and confidence in the pursuit prevails among the people.

BY WILLIAM BAIRD, VESPER.

ORCHARDS.

Date of first planting: All classes, in 1879, by William Baird, of Vesper.

None of the orchards have fruited, excepting the cherry.

Northern, sheltered slopes, are considered the most desirable locations for apple trees. Pear—Very little attention has been given to culture of the pear. It does best in sheltered locations, in bends of small streams, near native forests. This applies to all varieties of fruit planted in this locality, but artificial timber-belts, planted on upland, would produce the same results, probably, and I am of the opinion better results, as soil and location could be selected to suit the different natures of trees. Upland, with clay subsoil, is preferable to any other. Peach—Appears to be tender in this locality, and does not succeed unless completely protected by a natural or artificial timber-belt. Plum—Succeeds best near small streams of running water, but being a hardy tree, promises to succeed in most any location, if planted in clumps or groups. Cherry—Like the plum, bids fair to succeed in most any location.

Soil most productive: Apple and pear, sandy upland, having a clay subsoil; peach, plum and cherry, a rich, sandy, black loam. All do better where they are sheltered.

Preparation of the soil properly is one of the most essential things connected with orchard culture. The deeper it is plowed the better. To secure a greater depth, lay off the ground in lands two rods wide, run the plow twice in the same furrow, leaving a dead-furrow where the row is to be planted. After the row is set, re-plow, turning the land to the row, leaving the ground around the trees a little lower than elsewhere, forming a basin to gather and hold moisture. Thorough pulverizing is as essential as deep plowing. This treatment will apply equally to the preparation of land for all classes of fruit and forest trees. It is best to prepare land in the fall, that planting may be done as early in the spring as possible.

Set apple trees in rows about 30 feet apart, and alternate with peach trees in the rows, running east and west; set them two inches deeper than they stood in the nursery row. Pears may be planted in the apple orchard, alternating in the rows running north and south. If by themselves, set 20 feet each way. Peach—When planted alone, should be set 15 feet apart in the rows running east and west, and 30 feet the other way. Plum—Set in groups, along the streams or near native forests. If fowls are allowed the range of the orchard, they will be an advantage to the fruit crop. Cherry—Plant in same manner as the peach, recommended above. All trees should be firmly tied to a stake, with soft bands, which will not injure the bark.

Cultivation: The ground should be worked in spring as soon as grass and weeds start. Be careful that the trees are not chafed or rubbed by the plow. Deep cultivation near the trees must be avoided. By mulching with old prairie hay, very little cultivation will be needed. Plums and cherries may be treated as above stated.

Pruning: Apple should be pruned in the spring. Form low, spreading heads. In a prairie country they will bear thicker tops than in timber regions, or the Eastern States. Pear needs very little pruning, other than to shorten in leading branches. This should be done in spring. Peach should be trimmed lightly in spring. Plum and cherry require pruning only to balance the top. All classes of trees should be trained to form low heads.

Wind-breaks: These have been a decided advantage to orchards and gardens, and should be located on all sides. They should be formed with at least four rows, 10 to 12 feet apart, and trees set in the rows 4 feet apart, alternating with the trees in the adjoining row. The box elder, cottonwood, black walnut and white elm have been successfully used. The first two varieties are preferable. Cultivate sufficiently to keep down weeds and soil mellow, until they shade the land.

Fruit-growing has not sufficiently developed in this county to determine hat varieties to plant; but I would suggest such as are late bloomers, also native seedlings of a good and promising character. The best varieties of the native plum are doing well under cultivation. The Green Gage, Wild Goose, and Chickasaw plums are promising. Of cherries, the Utah Hybrid promises to excel all others.

SMALL FRUITS.

All classes were planted in spring of 1879, by this reporter. Blackberry succeeds on lowlands having a moist sandy soil; currant on northern slopes; gooseberry and raspberry on rich moist bottom land; strawberry in any location having a heavy clay, moist soil, and enriched with well-rotted manure.

All lands selected for small fruits should be prepared before planting, by a deep plowing and thorough pulverization.

Plant in early spring—blackberry in rows 6 feet apart, and allow the rows to thicken by the sprouts; currants in rows 6 feet apart; gooseberry in rows 6 feet each way; raspberry, same as blackberry; strawberry in double rows about 18 inches apart, leaving a space of 3 feet between.

Cultivation: Blackberry, gooseberry and raspberry—Keep down all the weeds with a hoe, and mulch heavily with wet straw. Currant—Keep free from weeds with plow and hoe. Strawberry—Should not be cultivated until after the fruiting season, then give thorough culture and mulch with sawdust or fine straw.

Pruning: Blackberry—Remove all dead wood, and thin out the young sprouts where too thickly grown. Gooseberry—When the stools form too thickly, take them up and divide, and re-set. Raspberry—Cut out all old wood in spring.

Varieties reliably productive, and in the order of their value: Blackberry, Kittatinny, Lawton, and Thompson's Thornless; currant, Utah, and native; gooseberry, White Smith, Houghton, and Crown Bob; raspberry, Blackcap and Ohio Ever-Bearing; strawberry, Monarch of the West.

Mulching has been an advantage to small fruit, both summer and winter.

Manure is beneficial to all classes, when well rotted and applied in spring, and thoroughly worked into the soil by cultivation.

VINEYARDS.

Date of first planting, spring of 1886, by Jacob Weidman, of Pleasant Valley.

Grape vines succeed on black, moist land, near the streams.

The land should be prepared very deep.

In planting, use one and two-year-old vines, set in rows 6 feet apart, and 4 feet in the row.

Cultivate deep and thorough, early in the spring.

Prune after the short or spur method.

(NOTE.—The best results are obtained from our native wild varieties, grafted with the cultivated classes.)

Owing to the late severe drouths, the present condition of horticultural investments in this county is rather discouraging.

LYON COUNTY.

BY. J. W. LOY, AMERICUS.

ORCHARDS.

Date of first planting: Am unable to report.

Location most desirable: The experiences of the past years rather indicate no material difference in results of different locations; and the same may be said with reference to character of soil, with the exception of wet lands, which should be avoided.

Deep and thorough preparation of the land before planted, by at least two years' cultivation, is of the first importance.

Planting: Should be done in spring-time. Apple, set 2 or 3 inches deeper than when they stood in the nursery, and never closer than 30 feet each way; peach, 15 to 18 feet each way. The plums grown are generally the native kinds, some of which are very good, and generally bear a crop.

Cultivation: Orchards should be planted to corn or potatoes, and well cultivated for six or eight years after planted.

Pruning: Apple—Prune any time from the middle of May to the middle of June; remove all cross-limbs, and thin out where the growth is too dense. Pear—Same as the apple. Sometimes they require a shortening of the top growth. Peach and plum—Remove all sprouts from the base and body, and the top will generally form about right. Cherry—Keep all sprouts cut away; but very little other work is needed.

Wind-breaks are an advantage, located on north, south and west of an orchard or garden. Construct in rows 8 feet apart, and close in the row; cultivate until they get a good start. The cottonwood, soft maple and peach are successful varieties for such purposes.

List of varieties of fruits which are productive, and named in the order of their value—*For family purposes:* Apple—Early Harvest, Hightop Sweet, Red Astrachan, Carolina Red June, Maiden's Blush, Rambo, Townsend (syn. Hocking,) Fulton Strawberry. Roman Stem, Dominie, Milam, Ben Davis, Northern Spy, Winesap, Willow Twig, Rawles Genet, White Winter Pearmain. Pear—Bartlett, Belle Lucrative, Seckel. Peach—Hale's Early, Crawford's Early, Crawford's Late, Heath Cling. Cherry—Early Richmond, English Morello, Gov. Wood. *For market purposes:* Apple—Winesap, Rawles Genet, White Winter Pearmain, Ben Davis, Willow Twig, Townsend, Rambo, Milam.

For a family orchard of 100 trees, the following varieties are preferred, and the number of each given: Apple—Summer, 2 Early Harvest, 2 Hightop Sweet, 2 Red Astrachan, 2 Carolina Red June; autumn, 4 Maiden's Blush, 4 Rambo, 4 Townsend, 4 Roman Stem, 2 Fulton Strawberry, 4 Fameuse, 4 Fall Wine; winter, 20 Winesap, 20 Rawles Genet, 10 Ben Davis, 10 Willow Twig, 3 Rome Beauty, 3 Romanite (syn. Pennock).

SMALL FRUITS.

Bottom soils are the most productive.

Its preparation should be deep and thorough.

Plant in early spring-time, in rows sufficiently distant to allow of easy cultivation. I have raised the currant successfully during the past eighteen years in Kansas; have preferred planting in rows running east and west, located on the north side of buildings or fences; apply annually a surface-dressing of wood ashes, and mulch lightly.

Strawberries should be mulched lightly in fall or early winter; keep the ground around the plants moist, and you will get strawberries.

List of reliably productive varieties, named in the order of their value: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Houghton; raspberry, Miami, and Doolittle; strawberry, Wilson's Albany and Triomphe de Gand.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that in 1879, was about the same of all classes.

The present condition of horticultural investments in this county is generally good. The results of the past year warrant extended efforts in the future, and the interest and confidence of the people in growing fruits is becoming quite general.

MARSHALL COUNTY.

BY JOHN M'KEE, MARYSVILLE.

ORCHARDS.

Location most desirable: A northwest slope for the apple and peach; cannot perceive any material difference in the results of the plum.

Soil most productive: A rich loam for all classes; if gravelly, all the better for pears; and well drained is better for the cherry.

Land should be thoroughly prepared by cultivation, before planted.

Planting should be done in the spring.

Distances: Apple, in rows 30 feet each way; all other classes at 15 feet each way.

Cultivation: Plow between the trees each way, turning the earth to the row. This system affords surface-drainage from the tree.

Pruning: Should be done during warm days in February. Remove all sprouts and interfering limbs.

Wind-breaks are an advantage on all sides of an orchard. Construct in rows 4 to 5 feet apart, and as many of such rows as one can afford. They will furnish timber in time, which is always valuable. Cottonwood, white maple and box elder are preferable for such purposes, and require cultivation for three or four years after planted.

For a family orchard of 100 apple trees, would plant the following varieties: Summer, 5 each of Early Harvest, Large Yellow Bough and Red Astrachan; autumn, 5 each of Maiden's Blush and Rambo; winter, 20 Winesap, 20 Rawles Genet, 25 Ben Davis, 10 Willow Twig.

For a market orchard of 1,000 trees: An even number each of Winesap, Ben Davis, and Rawles Genet.

SMALL FRUITS.

Date of first planting: Blackberry, in 1872, by Perry Hutchinson, of Marysville.

They succeed best on a northern location, and on rich sandy soil; should be planted in spring, in rows 4 feet apart; currant and gooseberry, same distance; strawberry, in rows 2 feet apart, and 1 foot in the row.

I find mulching for all classes preferable to any cultivation.

Pruning: Blackberry, cut back the growing canes in September; currant, remove all sprouts but one, and form that into a tree-shape; treat gooseberries in the same manner.

Preferred list of varieties: Blackberry, Kittatinny, and Lawton; gooseberry, Houghton, Downing, and a native variety; raspberry, native varieties are productive.

Mulching is an advantage in summer.

Manuring is profitable for currant and gooseberry; should be applied as a surface dressing in the fall.

VINEYARDS.

Date of first planting, in 1873, by Frank Schmidt, of Marysville.

Location most desirable: A southeast exposure.

Soil most productive: Rich and well drained.

Preparation necessary: Deep plowing before planted, and set in rows, 12 feet apart and 6 feet in the row. Use two-year-old plants, and mulch as soon as set.

Train to trellis, and prune very lightly after the first year.

The Concord, so far, has been the most successful variety grown.

McPHERSON COUNTY.

BY THEO. BOGGS, M'PHERSON.

ORCHARDS.

Date of first planting: Apple, and peach, in 1871; pear, plum, and cherry, in 1875; by N. L. Holmberg, Lindsborg.

Date of first fruiting: Apple, in 1879, by N. L. Holmberg; pear in 1878 and peach in 1876, by J. W. Lewis, of Farland.

Location most desirable: Apple, pear, peach, northern hill-side; plum, where ground will be tramped and protected from east and south winds; cherry, where protected from east and south winds.

Soil most productive: Black for wood growth, and clay for early fruiting, for all classes.

Preparation: Deep plowing.

Planting season: Early spring for all classes.

Distances: Apple, 30 feet each way, when protected by wind-breaks; pear, peach, plum and cherry, 16 to 20 feet each way.

Cultivation: Apple, pear and peach, as for potatoes, small early corn, or garden vegetables. These are an excellent crop to be grown in an orchard, but never use wheat or small grains. Avoid late stirring of the ground. For plum, cultivate for a few years, and then convert the ground into a chicken or hog-yard. Cherry, same as for plum for a few years, then sow to grass.

Pruning: Apple, in latter part of May or fore part of June; pear, very sparingly, in early spring; peach, in early spring; plum and cherry, very lightly.

Wind-breaks: Located on the south and west sides, have invariably proven an advantage. Constructed in rows, willow (gray), 4 to 6 feet apart, cottonwood, 8 to 12 feet apart. Cultivate for 3 or 4 years. Do not prune.

List of varieties, in the order of their value and productiveness: Apple and pear trees are too young to give any correct statement. Peach, Crawford's Early, Heath Cling, Hale's Early, Amsden's June, Stump the World, have fruited successfully. More seedlings have been planted than any others, because seeds are cheaper than grown trees. Plum, Wild Goose, Sand, Lombard. The Sand plum can easily be obtained from the sand-hills in an adjoining county. Cherry, Early Richmond, English Morello, and Black Morello.

SMALL FRUIT.

Date of first planting: All classes from 1870 to 1875, by N. L. Holmberg, of Lindsborg.

Location preferable: Blackberry, raspberry and strawberry anywwhere, if properly cultivated; currant and gooseberry do best in shade.

Soil most productive: Black, for all classes.

Preparation: Deep cultivation.

Planting season: Early spring.

System: Blackberry and raspberry, in rows 6 feet apart and 2 feet in the row; currant and gooseberry, in rows 4 feet apart, and 2 feet in the row; strawberry, in rows 2 feet apart, and 18 inches in the row.

Cultivation: Blackberry and raspberry should be shallow, to avoid disturbing the roots; currant and gooseberry, cultivate deeply; strawberry, keep all runners off, and hoe around the plants.

Pruning: Blackberry and raspberry, remove old wood and cut back ends of bearing canes in early spring; currant and gooseberry require but light pruning.

List of varieties in the order of value, and reliably productive: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Houghton; raspberry, Doolittle; strawberry, Wilson's Albany.

Mulching has been an advantage in winter and summer.

Manuring is profitable for all classes. Should be applied around the roots in winter.

VINEYARDS.

Date of first planting, 1875, by Chris. Hershler, of Christian.

Location: Any kind.

Soil most productive: Black.

Preparation: Deep and thorough.

Planting — distances: Rows, 8 feet apart, and 6 feet in row. Strong one-year-old plants are most desirable.

Cultivation: Sufficient to keep down weeds and encourage a good growth. Should be done from May to July.

Training: Wire trellis. Prune in very early spring.

The Concord leads all other varieties in success.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that of 1879: Apple, pear, blackberry, greater; plum, cherry, currant, gooseberry, raspberry and strawberry, equal; and of peach, less.

The present condition of horticulture, good, and the results of the past years warrant an extended investment in the future. There is a general interest and confidence in the pursuit among the people of this county.

MITCHELL COUNTY.

BY E. A. TAYLOR, BELOIT.

ORCHARDS.

Date of first planting: Apple, cherry and pear, in spring of 1871, peach in spring of 1870, and plum in spring of 1872, by James Hyde and William Bickle, of Beloit.

Date of first fruiting: Apple in 1877 and pear in 1879, by E. A. Taylor, of Beloit; peach and cherry, in 1874, by William Bickle, of Beloit.

Location most desirable: Apple, elevation, having any exposure except to the southwest; pear, northern exposure, altitude immaterial; peach, northern exposure; plum, immaterial as to exposure; cherry, sour kinds succeed on all kinds — sweet are fickle in any location.

Soil most productive: Apple, dry, fertile surface, with clay subsoil; pear, well drained, heavy clay; peach, any well-drained soil; plum, any well-drained, fertile soil; cherry, sour kinds, any good corn land — for sweet varieties, select a northern exposure, with heavy clay soil.

Preparation of soil necessary: Apple, deep plowing and thoroughly pulverized; pear should be subsoiled; peach, well pulverized, and plowed into ridges, where the trees are to set; plum and cherry, same as for a corn crop.

Season for planting: All classes in early spring.

System of planting, and distance: Apple—Set about three inches deeper than when in nursery; lean towards the southwest, in rows 24x24 feet. Pear—Plant deep; dwarfs 10 feet apart each way, and standards 15 feet apart each way. Peach, plum and cherry—Same depth of apples, in rows 12 feet apart each way.

Cultivation: Apple—Plant to corn during the first five years, and properly cultivate to grow a crop; then seed to clover and blue-grass, and pasture with hogs. Pear—Very little, if any, needed; mow the weeds. Peach, plum and cherry—Same as for apple, except would sow to grass the third year.

Pruning: From 1st to middle of June; head the trees low, remove all chafing limbs, and others, when required to balance the top. Pear—When the top is very thick, thin out, very seldom cut back a limb; time, fore part of June. Peach—Do not prune, except to remove the limbs less than two feet from the ground. Plum and cherry—Treat same as the apple.

Wind-breaks, when constructed of cottonwood, box elder, elm, honey locust or Osage orange, in rows 10 feet apart, with trees five feet apart in the rows, on the west and south side of orchards and gardens, have proven an advantage. These should be cultivated three or four years, and then seeded with blue-grass.

List of varieties of fruit, in the order of value and productiveness—*For family purposes:* Apple—Cooper's Early White, Missouri Pippin, Rawles Genet, Hightop Sweet. Pear—Clapp's Favorite. Plum—Wild Goose, Lombard, and Egg. Peach—Crawford's Early, George IV, Old Mixon Free. Cherry—Early Richmond, English Morello, and common Morello.

SMALL FRUITS.

Date of first planting: All classes in 1871.

Soil most productive: Blackberry, gooseberry and raspberry, rich, loose; currant, rich, with shade; strawberry, very rich and well drained, with a southern and eastern exposure.

Preparation of soil: Deep plowing, thoroughly pulverized and manured.

Time for planting: Blackberry and raspberry, October and November; currant and strawberry, in March and April.

System for planting: Blackberry, in rows 8 feet apart, and 6 in the rows—plant deep, and leave the ground level; currant, in rows 4 feet apart, and 2 feet in the row; gooseberry, in rows 4 feet apart each way; raspberry, in rows 5 feet apart, and 3 feet in the row; strawberry, in rows 3 feet apart, and 18 inches in the row.

Cultivation necessary: Blackberry, keep weeds down, cultivate with plow in March, and mulch; currant, frequent plowing and hoeing; gooseberry and raspberry, treat same as the currant; strawberry, frequent hoeing.

Pruning: Blackberry and raspberry, cut back, to encourage a strong, upright cane; currant and gooseberry, better to divide the crowns than to prune.

List of varieties reliably productive, in the order of their value: Blackberry, Kittatinny; gooseberry, Houghton; raspberry, Doolittle and McCormick; strawberry, Wilson's Albany.

The one variety most satisfactory, in plant and product: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Houghton; raspberry, McCormick; strawberry, Wilson's Albany.

Mulching has been an advantage in both summer and winter.

Manuring is profitable for all classes of small fruits; should be scattered broadcast over the land between October and April, at the rate of fifty wagon-loads to the acre.

VINEYARDS.

Date of first planting: Unknown.

Soil preferable: Fertile, having a well-drained subsoil.

Preparation of soil: Deep and thoroughly pulverized.

Distance for planting: 8 feet apart each way, using two-year-old vines.

Necessary cultivation: Plow and hoe until middle of July.

Training and pruning: Wire trellis; cut back two-thirds of the last year's growth.

List of varieties, in the order of success: For family and market use, Concord, Hartford Prolific, Ives Seedling.

MISCELLANEOUS NOTES.

The extent of planting in 1880 was only equal to one-half of that for 1879, owing to unfavorable weather at the time.

MIAMI COUNTY.

BY L. BISHOP, OSAWATOMIE.

ORCHARDS.

Date of first plantings: Wm. Chestnut, Osawatomie, planted apple, pear, peach and cherry in 1855, but the prairie soil on which they were planted was uncultivated, and but few of them succeeded; S. L. Adair, Osawatomie, planted apple and peach in 1856, and in 1857 planted cherry and pear; apple in 1860, and apples, peaches and cherries in 1861, but date of first fruiting cannot be given.

E. W. Robinson, of Paola, planted peach in 1859, which bore the next year; planted apple, pear, peach and plum in 1860. The apple, pear and plum succeeded pretty well, by being mulched and watered. Pears fruited in 1863, and in 1865 bore a heavy crop; apples bore in 1864, and a fair crop in 1866.

Daniel Martin, of Osawatomie, planted apple, pear, peach, cherry and plum in 1859. The trees succeeded well, but cannot give date of first fruiting of any, except that the peaches bore in 1861.

Calvin Barnard, of Osawatomie, planted apple and pear in 1859, and apple in 1861; succeeded well.

Richard Mendenhall, of Osawatomie, planted apple and cherry in 1867. Succeeded well, but cannot give date of first fruiting.

Several others planted as early as these, but planting, as a general thing, was not successful until 1861.

Location most desirable: Apple, pear, plum and cherry succeed best on elevated land; peach, on the highest that can be found. Such locations afford the most satisfactory results through a term of years, but occasionally lowlands have succeeded as well.

Soil most productive: Apple, plum and cherry, clay or sandy loam, well drained—that for the apple should be rather rich; pear and peach, sandy loam, having a dry subsoil.

Preparation necessary: Plow deep as possible and thoroughly pulverize.

Planting season: Apple and pear in autumn, if the ground is not too dry; peach, plum and cherry in early spring.

Distances: Apple, 33 feet apart, unless intended to thin out when the trees interfere—in such cases, 16½ feet each way; pear and cherry, 20 feet; peach, 16½ feet each way, and in every unfruitful year shorten in the strong branches from 4 to 6 feet, in proportion to the growth made; plum, 15 feet each way.

Cultivation: Apple and pear—Plow, and with cultivator and hoe keep the orchard clear of weeds until six years, then seed to grass or clover and mow it or convert it into a hog pasture. Peach—Should be cultivated during the first three years after planted, then treat as for the apple. Plum and cherry—Cultivate the first six years, then mow, or turn in hogs.

Pruning: For the apple and pear, January is the safest time in which to remove large limbs. Small branches can be taken off at any time. Train the head low and cut out all cross-limbs. In this county the growth inclines to overbalance the head towards the northeast, which should be cut back on that side more than any other. Peach—Form heads within 3 or 4 feet of the ground, and cut out all unnecessary branches. Plum—Form heads low, and thin out at any time. Cherry require low heads and less pruning than other classes.

Wind-breaks, located on the south side, are an advantage to orchards and gardens. Construct in rows 6 feet apart, and set in the row 2 to 3 feet apart. Cultivate until the trees have become well established. Unpruned hedges, black walnut, soft maple, white elm have been used successfully.

List of varieties, named in the order of their value and productiveness—*For family purposes:* Apple—Winesap, Jonathan, White Winter Pearmain, Rawles Genet, Lawver, Missouri Pippin, Ben Davis, Willow Twig, McAfee's Nonsuch, Grimes's Golden, Ortley, Yellow Bellflower, Milam, Early Harvest, Carolina Red June, Red Astrachan, Benoni, Lowell, Maiden's Blush. Pear—Bartlett, Flemish Beauty, Buffum, Duchesse d'Angouleme, Louise Bonne de Jersey, Clapp's Favorite, Vicar of Winkfield, Winter Nelis, Edmond, Howell, Glout Morceau. Peach—Amsden's June, Alexander, Brice, Hale's Early, Early York, Early Rivers, Early Louise, Snow, Druid Hill, Late Admirable, Yellow Rareripe, Ward's Late Free, Salway, Heath Cling. Plum—Wild Goose, Sand, and Damson. Cherry—Early Richmond, Leib, common Morello. *For market purposes:* Apple—Winesap, Lawver, Jonathan, Ben Davis, Willow Twig, Rawles Genet, White Winter Pearmain, Lowell, Maiden's Blush, Red Astrachan, Carolina Red June, Early Harvest. Pear—Doyenne d'Ete, Bartlett, Flemish Beauty, Clapp's Favorite, Buffum, Edmund, Howell, Duchesse d'Angouleme, Glout Morceau, Vicar of Winkfield, Winter Nelis. Peach—Brice, Amsden's June, Hale's Early, Early Rivers, Early Louise, Early York, Yellow Rareripe, Druid Hill, Late Admirable, Ward's Late Free, Salway, Heath Cling. Plum—Wild Goose, Sand, Damson. Cherry—Early Richmond, Leib, common Morello.

List of varieties and number of each to plant, preferred for a family orchard of 100 trees: Apple—Summer, 2 Early Red Margaret, 3 Early Harvest, 2 Carolina Red June, 1 Hightop Sweet, 3 Red Astrachan, 3 Red Stripe (Indiana), 4 Maiden's Blush, 3 Lowell; autumn, 3 Ortley, 3 Yellow Bellflower, 3 Grimes's Golden, 2 Celestia, 4 Jonathan, 2 Northern Spy; winter, 15 Winesap, 15 Rawles Genet, 5 Missouri Pippin, 15 Lawver, 5 White Winter Pearmain, 5 Ben Davis, 2 Moore's Sweet.

List of varieties and proportions of each to plant, named in the order of profit, for a market orchard of 1,000 trees: Apple—300 Winesap, 200 Ben Davis, 200 Lawver, 100 Jonathan, 100 Rawles Genet, 100 Missouri Pippin.

SMALL FRUITS.

Location preferable: Blackberry, currant, gooseberry and raspberry succeed on low or high land; strawberry on high land.

Soil most productive: Blackberry, well-drained loam; currant, moist loam; gooseberry, moist loam; raspberry, moist and rich land; strawberry, well-drained, rich, sandy land.

Preparation necessary: Blackberry, thoroughly plowed; currant, gooseberry and raspberry, heavily manured and thoroughly plowed; strawberry, manure, pulverize and plow under, then harrow and manure on the surface after planted.

Planting season: In spring, as a rule.

System: Blackberry and raspberry, in rows 8 feet apart, and 3 feet in the row; currant, in rows 6 feet apart, and 4 feet in row; gooseberry, in rows 7 feet each way; strawberry, in rows 3 feet apart.

Cultivation necessary: Blackberry—Keep clear of weeds with plow or hoe. Currant, gooseberry and raspberry—Keep weeds down, and mulch. Strawberry—Thorough cultivation the first year. Remove all runners as they form in the growing season, and cover with a mulch December 1st. In the spring as soon as they start, open the mulch sufficiently to allow the growth to come through.

Pruning: Blackberry and raspberry, pinch off the ends of growing canes as soon as they reach 4 feet in height; currant and gooseberry, thin out the old wood.

List of varieties reliably productive, named in the order of their value: Blackberry, Kittatinny; currant, White Grape, White Dutch, Red Dutch; gooseberry, Downing; raspberry, McCormick; strawberry, Longworth and Col. Cheney.

The one variety which affords the most satisfactory results, in plant and fruit: Kittatinny blackberry, White Dutch currant, Houghton gooseberry, McCormick raspberry, Longworth's Prolific strawberry.

Mulching has been an advantage in winter and summer.

Manuring is profitable with all classes where the soil is not naturally quite rich; should be applied in autumn or early spring, as a surface dressing.

VINEYARDS.

Location most desirable: High and well drained.

Soil most productive: Rich, sandy loam.

Preparation: Well plowed, and if not rich, should be manured.

Planting: In rows, 8 feet apart each way.

Cultivation: Keep clean with plow and hoe.

Train on wire trellis.

Prune to long arms in February or March, very little in summer.

List of varieties in the order of success: For family use, Concord, Dracut Amber and Champion; for market, Champion and Concord.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that of 1879: Apple, pear, peach, plum, cherry, raspberry and strawberry was greater; blackberry and gooseberry about the same.

The present condition of horticultural investments is quite encouraging. The results of the past years warrant extended investments in the future.

BY JOHN L. MASON, NEW LANCASTER.

ORCHARDS.

The experiences of the past years determine the following facts as most desirable for fruit culture:

Location preferable for the apple, pear, peach, plum, and cherry: A northern slope.

Soil most productive: The red or mulatto soil.

Preparation for planting: Deep plowing and thorough pulverizing.

Preferable season for planting: In the spring.

Method and distances to plant: Dig large holes, and fill partly full with surface soil mixed with manure before setting the tree. Set apple 22 feet each way; pear, 18 feet each way; peach, plum and cherry, 16 feet each way.

Cultivation: Plant between the rows corn, sorghum, or potatoes, and cultivate until July.

Pruning season: In autumn and mild weather in winter, for all classes except the cherry, which should be pruned in summer and autumn.

Wind-breaks have been an advantage to orchards and gardens, when located on the south and north; constructed of cottonwood and maple, in rows 4 feet each way; peach trees 12 feet each way. Cultivate each year, as required for a corn crop.

List of varieties, in the order of their value and productiveness: *For family purposes:* Apple — Mason's Orange, Winesap, Maiden's Blush, Rawles Genet, Lady's Fancy, Early Harvest, Missouri Pippin, Yellow June, Ben Davis, Carolina Red June, Buckingham (syn. Missouri Queen), Rambo, Gilpin. Pear — Bartlett. Peach — Hale's Early, Heath Cling, Crawford's Late. Cherry — Early Richmond. *For market purposes:* Apple — Ben Davis, Winesap, Missouri Pippin, McAfee's Nonsuch, Carolina Red June, Gilpin, Rawles Genet. Pear — Bartlett. Peach — Hale's Early, Heath Cling. Cherry — Early Richmond.

List for a family orchard of 100 trees, varieties preferred, and number of each to plant: Apple — Summer, 2 Early Harvest, 3 Carolina Red June, 2 Yellow June; autumn, 6 Maiden's Blush, 4 Rambo, 3 Lady's Fancy; winter, 20 Mason's Orange, 20 Winesap, 15 Ben Davis, 10 Missouri Pippin, 10 Rawles Genet, 5 Gilpin.

For a market orchard of 1,000 trees, varieties reliably productive, named in the order of profit, and proportions of each to plant: Apple — 400 Ben Davis, 400 Winesap, 100 Missouri Pippin, 100 Rawles Genet.

SMALL FRUITS.

Location preferable: Blackberry and gooseberry succeed on most every character of location; currant, north side of a fence; raspberry, highlands. Land selected for small fruits should be plowed deep, and thoroughly pulverized.

Plant all classes in spring, and in rows 4 to 6 feet apart each way, excepting the strawberry.

Cultivation the first year should be that required for a corn crop; thereafter keep well mulched.

The Kittatinny blackberry and Houghton gooseberry are the most profitable classes of small fruits.

The present condition of investments in fruit growing is encouraging to such persons as will give the pursuit a proper attention. Many planters have lost largely by neglect.

MONTGOMERY COUNTY.

BY L. A. WALKER, INDEPENDENCE.

ORCHARDS.

Date of first planting: Apple, pear, peach and cherry, in 1871, by Thomas Overfield, of Independence.

Date of first fruiting: Apple, 1877, Maiden's Blush; pear, 1879, Belle Lucrative; peach, 1874, many varieties; plum, 1877; currant, 1875—all on the farm of Mr. Overfield.

Location preferable: Apple and pear, undecided—many planters favor a northern slope; peach, plum and cherry, northern slope.

Soil most productive: Apple, limestone and sandstone; pear, not determined; peach and plum, sandstone; cherry, Morello varieties succeed on all classes.

Preparation necessary: Thorough and deep plowing; subsoil stirring if possible.

Planting season, spring.

Method: Set the trees about 2 inches deeper than they stood in the nursery, and lean slightly to the southwest. Apple, 30 feet; pear, peach, plum and cherry, 18 to 20 feet each way.

Cultivation: Apple, plant and cultivate to corn for several years, or until they commence fruiting; pear, peach, plum and cherry, cease after second year from planting.

Pruning: Apple—Early in spring. Keep the head trimmed out, and water sprouts removed; all unnecessary limbs should be removed while they are small. Pear—In early spring. Cut back strong-growing limbs. Peach, plum and cherry—In early spring.

Wind-breaks, located on the south and north sides, are an advantage to the orchard and garden. Construct in rows 8 feet apart, and 4 to 8 feet in rows, and thin out as the after-growth requires. Cultivate with plow and hoe as would be necessary to grow any ordinary crop. The classes of trees successful are as follows: The Osage orange, if allowed to form into trees, catalpa, soft maple, ash, walnut, and cottonwood.

List of varieties, in the order of value and productiveness—*For family purposes:* Apple—Early Harvest, Maiden's Blush, Jonathan, Winesap, Missouri Pippin, White Winter Pearmain, Willow Twig, Ben Davis. Pear—Bartlett, Belle Lucrative, White Doyenne, Vicar of Winkfield. Peach—Hale's Early, Early York, Stump the World; for late, Delaware, Crawford's Late, Old Mixon Free. Plum—Chickasaw. Cherry—Early Richmond and other Morello varieties. *For market purposes:* Apple—Early Harvest, Red Astrachan, Maiden's Blush, Rambo, Ben Davis, Jonathan. Peach—Hale's Early,

Early York. For home market: Stump the World and Old Mixon. Cherry—Common Morello is the most reliable variety in this locality.

Family orchard of 100 trees: Apple, 10 summer, 10 autumn, 80 winter.

SMALL FRUITS.

Location: Any suitable for corn.

Soil: All classes, except currants, succeed on any of the soils.

Preparation: Such as is suitable for a good corn crop.

Planting season: Spring.

System: Blackberry and gooseberry, in rows 8 feet apart, and 4 feet in row; raspberry, in rows 6 feet apart, and 4 feet in the row; strawberry, in rows 5 feet apart, and 1 foot in the row.

Cultivation: Use a one-horse cultivator, and hoe frequently during the growing season.

Pruning: Blackberry, remove all old wood and suckers in the rows; gooseberry, open up the centers to the sun; raspberry, remove all but four canes to each stool, and pinch back the growing cane when 2½ feet high.

List of varieties reliable and productive: Blackberry, Kittatinny; gooseberry, Houghton; raspberry, Miami for a black, and Turner for a red; strawberry, Captain Jack and Charles Downing.

Mulching has been an advantage, in both summer and winter.

Manuring has been profitably applied to raspberries and strawberries; spread on the land at the rate of twenty wagon-loads per acre, in the fall, and worked in.

VINEYARDS.

Date of first planting: In 1871, by Thomas Overfield, of Independence.

Location most desirable: Southeast exposure.

Soil most productive: Sandstone base.

Preparation: Deep and thorough plowing before planted.

Distance: In rows, 8 feet each way. Two-year-old plants are found to be the best.

Cultivation: Shallow plowing, in early spring or fall; keep down weeds with hoe.

Training and pruning: To trellis or stakes. If the first, prune to renewal system; if the last, prune to two eyes—the spur system.

List of varieties in the order of success: For family use, Concord, Dracut Amber, Martha, Delaware; for market, Concord.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that of 1879: Less of all classes.

The present condition of investments in horticulture is moderately good. The results of past years warrant a reasonable investment in the future.

MORRIS COUNTY.

BY F. B. HARRIS, WHITE CITY.

ORCHARDS.

Date of first planting: Apple in 1860, by Wm. H. White and C. Croley, of Council Grove; pear in 1877, peach in 1872, by parties unknown; plum in 1876, and cherry in 1868, by this reporter.

Date of first fruiting: Apple, in 1870, from the orchards of Wm. H. White and C. Croley, at Council Grove.

Location most desirable: Apple and peach, upland; plum and cherry, upland, protected with shelter-belts; pear, bottom land.

Soil most productive: For apple, that found on rolling upland; pear, well-drained bottom land; peach, poorest hillsides; plum, sides of ravines, well drained, or in places where fowls range and the ground is kept packed and clear of grass or weeds; cherry, high prairie, well mulched with manure.

Preparation: The land should be thoroughly cultivated at least two years before planted to trees.

Planting season, of all classes, should be in spring.

Method and distances: Apple—In rows, 30 feet apart each way; set trees one inch deeper than they were in the nursery. Pear—In rows, 18 feet apart each way, and alternate with plum. Form a ridge around the trees, by plowing towards them the first two or three years. Peach—Alternate in the apple orchard. Cherry—Treat the same as pear or plum.

Cultivation: Apple and peach—Work the ground with a cultivator from early spring until the first of August. After they have been planted four or five years, give the ground under them a top-dressing of rich loam, and in dry seasons apply a mulch of rotten straw in July and August. Pear—Cultivate early and late. It is the best remedy for the blight. Plum and cherry—Cultivate early and mulch late.

Pruning: Apple—At any time. Form heads three feet from the ground, with three or four branches evenly distributed around the body. Maintain a center stem, and induce a spreading top. Remove any limbs liable to cross, and all suckers, unless such as may be needed to form branches on the south side. Pear and cherry require no pruning, except to form a balanced head. Peach and plum—Form a head from 2½ to 3 feet from the ground, and remove all suckers.

Wind-breaks: Located on all sides of an orchard, and on the north of a garden, have been an advantage. Construct five rows 8 feet apart, and plant in the row 6 feet apart. Arrange the trees so that each row will alternate with those in adjoining rows. Cultivate five or six years as for corn, then seed to blue-grass.

SMALL FRUITS.

Date of first planting: Blackberry in 1877, and gooseberry in 1876, by this reporter; raspberry in 1877, by D. L. Phillips, of Camden; strawberry in 1876, by C. Kear, of Parkerville.

[The following recommendations are made from my judgment, more than from experience:]

Location preferable: Blackberry, bottom land; gooseberry, raspberry and strawberry, high prairie.

Soil most productive: For blackberry, both high prairie and bottom land; for strawberry, such as is found on high prairie.

Preparation: For blackberry, raspberry, currant, gooseberry and strawberry, the soil should be well subdued, and heavily enriched with manure.

Planting: Spring-time, for all classes.

System: Blackberry, in rows north and south, 8 feet apart and 3 feet in row; currant, in rows on north side of a stone fence; gooseberry, set in the rows of a young wind-break running east and west; raspberry, in rows 5 feet apart and 3 feet in the row. Strawberry—With a plow throw the land in beds 4 feet wide. In the center of each bed plant a double row, these being 16 inches apart. Set plants in the rows 1 foot apart; cultivate thoroughly the first year with horse cultivator and hoe. Second year allow the plants to form into matted rows, keeping only a path, one foot wide, open midway between the double rows. After the fruit has been picked, surface-dress the beds with fine manure, and work in fine dirt from the paths among the plants to cover the newly-forming roots and crowns deeper, as they incline to form too near the surface, and therefore suffer from exposure.

Cultivation necessary: Blackberry—Thorough until the end of August, keeping down all sprouts after the first year. Heavy mulching is preferable to cultivation. Gooseberry, raspberry and currant—Thoroughly cultivate for two years, then heavily mulch with manure. Strawberry—Working the ground thoroughly, the first year; then use liquid manure freely, and mulch in winter with coarse straw.

Pruning: Blackberry—Remove the old canes in spring; cut back the growing cane when 2 feet high, and the following spring cut back the branches of the canes fully one-third of their length. Currant—Remove all old bearing wood every two or three years, allowing four or five sprouts to grow from the root each year. Gooseberry—Train to a single stalk, and form it into a miniature tree. Raspberry—Cut back the canes fully one-third of their year's growth.

The Kittatinny blackberry, blackcap raspberries and Wilson's Albany strawberry are the only varieties of small fruits which afford satisfactory results, in plant and fruit.

Mulching has been an advantage in winter and summer, with cultivation.

Manure has been profitable with all classes. Should be well rotted, and applied in the fall as a top-dressing, at the rate of 18 tons per acre, and worked into the land by cultivation.

VINEYARDS.

Date of first planting: In spring of 1879, by Elisha Pearson, of White City.

The grape succeeds on any rich soil, and in any location.

Soil should be well subdued, deeply plowed and enriched before planted. Set in rows running north and south, 8 feet apart, and same distance between plants, in the row. Should be manured in the spring, and constantly cultivated throughout the summer. Cut back in spring quite heavily, and train to a wire trellis.

The Concord leads.

MISCELLANEOUS NOTES.

The extent of planting in 1880 compared with that for 1879: Apple, blackberry and raspberry, one-third more; pear, plum and cherry, equal to; peach, much less; strawberry, fully double.

The present condition of the horticultural interest is very good. The people feel warranted to plant more largely than heretofore.

NESS COUNTY.

BY WM. HARDING, NEVADA.

ORCHARDS.

Date of first planting: Apple, plum and cherry in 1878, and peach in April, 1877, by B. F. Garrett, of Bazine.

Location most desirable: Apple and peach should be planted on upland or table-land. A black, loamy soil appears to afford the best results.

Preparation of the land: Deep plowing—say at least 10 inches—in the spring; the following fall enrich with well-rotted stable manure, and plow again, and plant the following spring.

Plant the apple 1 rod apart each, and peach 12 feet. Cultivate the apple during the first four years as should be for corn, and peach for two or three years.

Prune in April, to form low-headed trees. Start the heads of peach trees from near the ground, and keep all dead limbs cut out.

Wind-breaks are an advantage to the orchard, on the south and west. As a temporary shelter, patches of corn are planted on the sides, when needed.

SMALL FRUITS.

Were planted in 1879, by Wm. Mixson, at Danby.

The blackberry does well in any location where the soil is rich, and if not so naturally, should be made so with well-rotted manure.

The preferable season for planting is, in early spring, for all classes except the strawberry, which should be set in October.

Set blackberry and raspberry in rows 4 feet apart, and 3 feet in the row; currant and gooseberry, in rows 3 feet apart, and 2 feet in the row; strawberry, in rows 2 feet apart, and plants, 10 inches in the row. Cultivate the first year, and mulch afterwards.

Pruning: Blackberry, remove the old and worthless stalks, and cut back the new-made canes; currant and gooseberry, cut out the oldest and poorest stalks.

Mulching has been an advantage in winter and summer.

Manuring is profitable for most classes of small fruits; should be applied in the fall.

The planting in 1880, of apple and peach, was greater than in 1879; blackberry, about the same.

The present condition of trees, etc., planted heretofore, is not very good, owing to the dry weather of the past season, and yet the people are not discouraged, but feel a deep interest in fruit growing.

NEOSHO COUNTY.

BY GEO. W. ASHBY, CHANUTE.

ORCHARDS.

Date of first planting: All classes, in 1872, by E. Z. Roth, Chanute.

Date of first fruiting: Apple in 1878, pear in 1880, peach and plum in 1877, cherry in 1876, on the farm of E. Z. Roth, Chanute.

Location preferable: Apple and pear, upland, having a western or northern slope; peach, tree the most hardy on upland, and finest fruit produced by trees growing in the valleys; plum, anywhere, if of the Chickasaw variety; cherry, immaterial.

Soil most productive: Sandy and heavy limestone. Pear — Good crops of the pear have been produced on poor, sandy land; peach, rich limestone; plum and cherry, on all classes.

Preparation necessary: Deep and thorough plowing. If the land is poor, it should be dressed with manure and plowed under. This treatment applies to all classes.

Planting season: Apple and pear, in autumn; peach, plum and cherry, in spring.

Distances: Apple, 25 feet each way for close-top varieties, and 30 feet for the heavy, spreading classes; pear, dwarfs 12 feet, and standards 20 feet each way; peach, plum and cherry, 16 feet each way.

Cultivation: Plant and cultivate apple and pear with corn the first six years, or until the trees so interfere as to prevent—then seed to clover; peach, plum and cherry, same as the apple, during the first three years.

Pruning: Apple and pear, whenever the tree needs it; peach, cut back the terminal growth of the limbs in August.

Wind-breaks, constructed on the south and west sides, in rows 4 to 8 feet apart, and trees 2 to 6 feet in the row, have been an advantage to orchards and gardens. The Osage orange, willow, poplar, cottonwood, soft maple and elm have been successfully used; should be well cultivated with plow and hoe until old enough to care for themselves.

List of varieties in the order of their value and productiveness: *For family purposes:* Apple—Carolina Red June, Early Harvest, Red Astrachan, Maiden's Blush, Rambo, Lowell, Ortley, Fall Pippin, Rawles Genet, Winesap, Missouri Pippin, Gilpin, Ben Davis, Limber Twig, Rome Beauty. Pear—Bartlett, Duchesse d'Angouleme, Flemish Beauty. Peach—Amsden's June, Hale's Early, Crawford's Early, Crawford's Late, Heath Free, Smock, Heath Cling, Large Early York. The last variety is one of the best grown in the county. Plum—Chickasaw, Wild Goose. Cherry—Early Richmond, English Morello, Reine Hortense. *For market purposes:* Apple—Early Harvest, Carolina Red June, Hightop Sweeting, Red Astrachan, Maiden's Blush, Rambo. The orchards in this county are yet young. Pear—Bartlett, Duchesse d'Angouleme. Peach—Amsden's June, Hale's Early, Troth's Early Red, Early York, Crawford's Early, Crawford's Late, Smock, Heath Free, Heath Cling. Plum—Chickasaw, Wild Goose. Cherry—Early Richmond, English Morello.

List of varieties, and the proportion of each, preferred for a family orchard of 100 trees: Apple—Summer, 2 Carolina Red June, 2 Early Harvest, 2 Red Astrachan, 2 Cooper's Early White, 2 Summer Queen; autumn, 3 Lowell, 3 Maiden's Blush, 6 Rambo, 3 Fall Wine; winter, 15 Rawles Genet, 10 Ben Davis, 10 Winesap, 10 Missouri Pippin, 10 Grimes's Golden, 5 White Winter Pearmain, 5 White Pippin, 5 Jonathan, 5 Gilpin.

List of varieties most reliable, and proportions of each, named in the order of their profit, for a market orchard of 1,000 trees: Apple, 250 each, Rawles Genet, Ben Davis, Winesap, and Missouri Pippin. Quality has but little influence on the market; a red variety which is productive, is of the first consideration in making up a list for a market orchard.

SMALL FRUITS.

Date of first planting: All classes in 1872, by your reporter.

Location preferable, immaterial, excepting with the currant, which requires shade, as found on the north side of a fence or stone wall.

Soil most productive: Deep, black rich loam, well drained.

Preparation necessary; Thoroughly plowed and pulverized; and if not rich, should be made so with well-rotted manure.

Planting season: Autumn, or very early spring, for all classes except the strawberry, which should be in early spring.

System: Blackberry, in rows 8 to 10 feet apart, and two feet in row — sections of roots 2 inches long, dropped in open furrows, and covered the same as corn, grow readily; currant, gooseberry, and raspberry, in rows 4 feet apart; strawberry, in rows 4 feet from each other, and plants 18 inches in the row.

Cultivation: Clean, with plow, and mulch.

Pruning: Blackberry—Head back the growing canes at 3 feet high, and remove old canes in winter. Gooseberry—Remove the old wood as it becomes productive. Raspberry—Cut back the trailing canes only at 2 feet.

List of varieties reliably productive, in the order of value: Blackberry, Kittatinny; gooseberry, Houghton; raspberry, Miami, Turner, and natives from the woods; strawberry, Wilson's Albany, Chas. Downing, Warder, and Captain Jack.

The one variety that affords the most satisfactory results in plant and product: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Houghton; strawberry, Wilson's Albany.

Mulching has been an advantage, both in winter and summer.

Manuring is profitable to all classes; should be applied to the surface and in the fall, and plowed under.

VINEYARDS.

Date of first planting, in 1872, by Alex. Maxwell, Chanute.

Location most desirable: Well surface-drained.

Soil most productive: Limestone or sandstone base.

Preparation: Plow and pulverize deep, and manure where the land is thin.

Distance: Set plants (two years old are most suitable) in rows 8 feet apart each way.

Cultivation: Plow and hoe through the spring and summer, and late in the fall plow again.

Training and pruning: Train to trellis, and cut back the last season's growth in early spring, leaving only the number of buds that the vine is able to mature the fruit from.

List of preferred varieties, in the order of success: For family use, Concord, Dracut Amber, Ives, Clinton; for market, Concord, Dracut Amber.

MISCELLANEOUS NOTES.

The extent of planting in 1880 was equal to that of 1879, of all classes.

The results of the past years are sufficient to warrant extended investments in the future. There is a general interest and confidence in the pursuit with the people of this county.

NEMAHA COUNTY.

BY S. J. EDGERLY, SENECA.

ORCHARDS.

The first planting was made by John Root (now dead) and Walter Gage, of Seneca.

Location preferable: Apple, peach and cherry, northeastern slope.

Soil most productive: Apple, red clay; pear, peach, plum and cherry, thin red clay.

Preparation of soil: For apple, pear, peach, plum and cherry, deep plowing and thorough harrowing.

Season preferable for planting: All classes in spring.

Distances: Apple, 28 feet; pear, 20 feet; peach and cherry, 15 feet each way.

Cultivation: Stir the ground with cultivator, and hoe around the trees from early spring to August 1st, for all classes.

Pruning: Apple, in mild weather, February and March. Thin out the head, so as to admit sunlight and air, and remove all chafing limbs. Pear and plum, do not prune; peach and cherry, lightly, before sap starts.

Wind-breaks are beneficial. Use Osage orange, honey locust, maple and cottonwood, in rows, 6x8 feet apart each way, alternating in the rows. Should be constructed on the south and west sides, and cultivated the first three or four years, then left to themselves.

List of varieties, in the order of value and productiveness—*For family use:* Apple—Summer, Early Harvest, Red Astrachan, Carolina Red June, Duchess of Oldenburgh; autumn, Rambo, Maiden's Blush, Fall Wine, Fameuse; winter, Winesap, Ben Davis, Rawles Genet, White Winter Pearmain, Missouri Pippin, Jonathan, Gilpin, Baldwin, Talman's Sweet. Peach—Amsden's June, Alexander, Stump the World, Crawford's Early, Crawford's Late, and choice seedlings. Plum—Wild Goose and Miner. Cherry—Early Richmond, May Duke, English Morello, Belle Magnifique. *For market purposes:* Apple—Winesap, Ben Davis, Rawles Genet, Missouri Pippin, White Winter Pearmain, Baldwin. Cherry—Early Richmond, Belle Magnifique, English Morello.

Varieties preferred, and proportion of each, to plant for a family orchard of 100 trees: Apples—Summer, 4 Carolina Red June, 3 Early Harvest, 3 Red Astrachan; autumn, 5 Maiden's Blush, 5 Rambo, 5 Fameuse, 5 Fall Wine; winter, 15 Winesap, 10 Ben Davis, 10 Rawles Genet, 10 Missouri Pippin, 10 White Winter Pearmain, 5 Baldwin, 5 Jonathan, 5 Gilpin.

Varieties most reliable, and proportion of each, named in the order of profit for a market orchard of 1,000 trees: Apple—200 Rawles Genet, 200

Winesap, 200 Ben Davis, 100 White Winter Pearmain, 100 Missouri Pippin, 100 Gilpin, 100 Jonathan.

SMALL FRUITS.

Location preferable: Blackberry, hillside; currant, hillside with shade; gooseberry and raspberry, hillside; strawberry, well drained, with moderate slope.

Soil most productive: A black loam for all classes.

Preparation of soil: Well plowed and harrowed.

Season for planting, spring.

System for planting: Blackberry, in rows 4 feet apart; currant, so as to be shaded; gooseberry and raspberry, in rows 3 feet by 4 feet; strawberry, in rows 3 feet apart, plants 1 foot apart in the row.

Cultivation necessary: Blackberry, gooseberry, raspberry, and strawberry, frequent stirring with cultivator, and hoeing; currant, heavy mulching.

Pruning: Only removing dead canes.

List of varieties established as reliably productive, in the order of value: Blackberry, Kittatinny and Lawton; currant, Red and White Dutch; gooseberry, Houghton; raspberry, Doolittle, McCormick (syn. Mammoth Cluster); strawberry, Wilson's Albany.

The one variety resulting most satisfactorily in plant and product: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Houghton; raspberry, Doolittle; strawberry, Wilson's Albany.

Mulching has proven an advantage, in both summer and winter.

Manuring, not profitable.

VINEYARDS.

Location most desirable, hillside.

Soil most productive, red clay loam.

Preparation of soil: Deep trenching, with plow or spade.

Distance for planting, 8 by 8 feet. One and two-year-old plants are most suitable.

Cultivation: With plow and hoe, from spring until the first of August.

Train to wires, and cut canes back each year.

List of preferred varieties, in order of success: For family use, Concord, Hartford Prolific, Ives; for market purposes, Concord.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with 1879: Apple, peach, cherry and of small fruits, one-fourth greater; pear and plum, smaller.

The present condition of investments in the pursuit of horticulture is generally good.

As facilities for obtaining knowledge of better methods increase, so the interest has increased, and more attention and care are given and far better results secured, which warrant extended investments in the future.

OSAGE COUNTY.

BY J. G. CLARK, WAVELAND.

ORCHARDS.

Date of first planting: Apple, pear, peach, plum and cherry, in the spring of 1863, by this reporter, at Waveland.

Date of first fruiting: Apple and cherry in 1869, pear in 1868, peach in 1866, plum in 1870, on the farm of this reporter, at Waveland.

Location most desirable: Apple, northern exposure; pear, places sheltered from the south and west winds; peach, elevated, and inclining to the north; plum, high and sheltered; cherry, no apparent difference.

Soil most productive: Apple, any that is rich; pear, rich loam having a clay subsoil; peach, rich and sandy; plum, rich land; cherry, any rich and well drained.

Preparation of the land before planted: Should be deep; plow, and thoroughly pulverize with a harrow.

Planting season: In spring, for all classes.

Distances: Apple, in rows 24 feet each way; pear, 16 by 20 feet; peach and plum, 10 by 16 feet; cherry, 12 by 16 feet. Dig no holes deeper than the land has been plowed. Set the tree in place, and pack dirt firmly among the roots.

Cultivation necessary: A one-horse, five-tooth cultivator is an excellent implement for the work. Clear weeds from around the trees with a hoe. Cultivate as often as once every two weeks until the middle of August, and never later.

Pruning: Do as little such work as possible; keep the form of the heads of trees well balanced, and remove chafing limbs. The time is, whenever needed.

Wind-breaks are of great value, and are of the most importance on the south side first, west next, and north last. Plant in rows 4 feet apart each way, and thin out as they interfere by growth. Should not be trimmed. Cultivate as for corn, until they are large enough to shade the ground. The catalpa, Osage orange, maple, black walnut and butternut are useful for such purposes.

List of varieties of fruit for family purposes, named in their order of value and productiveness: Apple—Winesap, Maiden's Blush, Seek-no-further, Rawles Genet, Talman's Sweet, Jersey Sweet, Dominie, White Winter Pearmain, Mountain Rose, Early Harvest, Smith's Cider, Jonathan, Red Winter Pearmain, Rambo, Baldwin. Pear—Bartlett, Seckel, Louise Bonne de Jersey, Duchesse d'Angouleme, Vicar of Winkfield. Peach—Alexander, Smock, Heath Cling, Foster. Plum—Smith's Orleans. Cherry—Early Richmond and English Morello.

List of varieties, and number of each to plant, for a family orchard of 100 trees: Apple—Summer, 5 Early Harvest, 5 Keswick Codlin; autumn, 5 Dominie, 5 Talman's Sweet; winter, 40 Winesap, 10 Rawles Genet, 5 Jersey Sweet, 10 Red Winter Pearmain, 5 White Winter Pearmain, 10 Northern Spy.

For a market orchard of 1,000: Apple—250 Winesap, 250 Red Winter Pearmain, 50 Mountain Rose, 50 Seek-no-further, 50 Rawles Genet, 50 Baldwin, 50 White Winter Pearmain, 50 Northern Spy, 50 Dominie, 25 Gravenstein, 50 Rome Beauty, 25 Jonathan, 25 Red Astrachan, 25 Maiden's Blush.

SMALL FRUITS.

Date of first planting: Blackberry, gooseberry and strawberry, in 1874, raspberry in 1875, by E. J. Clark, of Waveland, Shawnee county.

Location preferable: Blackberry, high, if not too dry; gooseberry, no difference; raspberry, east or western slope; strawberry, high and nearly level.

Soil most productive: A sandy loam.

Preparation necessary: Deep plowing and well pulverized. For strawberry, the land should be well manured before planted, and thoroughly worked in by plowing.

Planting season: All classes in the fall, and in rows.

Cultivation should be the same as required for corn, until September 1st.

Pruning: Blackberry and raspberry, pinch off the ends of the growing canes when they are 2 feet in height, and shorten in the laterals to 18 inches from the cane.

List of varieties reliably productive, named in the order of their value: Blackberry, Kittatinny; raspberry, Davidson's Thornless, Doolittle, McCormick; strawberry, Wilson's Albany.

The one variety which affords the most satisfactory results in plant and fruit: Kittatinny blackberry, Davidson's Thornless raspberry and Wilson's Albany strawberry.

Mulching is very essential to small fruits, in summer and winter.

Manure is profitable for blackberries if the land is poor. Raspberry and gooseberry should be manured moderately, and strawberry requires plenty of manure if the land is not very rich; should be applied either broadcast or directly to the plant, just after the fruit is taken off.

VINEYARDS.

Date of first planting: In the spring of 1863, by J. G. Clark, of Waveland.

Location most desirable: An eastern slope.

Soil most productive: A rich loam, having a loose subsoil, well drained.

Preparation necessary: Should be plowed deep by subsoiling, before the vines are set. Plant deep and in rows, 8 feet apart each way. Strong one-year-old plants are preferable.

The cultivation should be thorough and clean. Train to a low trellis, and prune after the arm system.

For family use: The Delaware, Hartford Prolific, Ives, Concord, Union Village, Diana and Adirondac are preferable.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that of 1879, was about the same of apple, greater of pear, and less of the peach.

The present condition of the horticultural investments in this county is encouraging, and the results of the past years warrant extended efforts in the pursuit in the future.

OTTAWA COUNTY.

BY J. W. M'LAREN, SUMMERVILLE.

ORCHARDS.

Date of first planting of all classes: 1873, by J. W. McLaren, Summerville.

Date of first fruiting: Peach in 1878, cherry in 1879, apple in 1880, (pear and plum have not yet fruited,) on the farm of J. W. McLaren, Summerville.

Most desirable location: Apple, rolling, well-drained land, having a northern slope; pear succeeds equally on flat and rolling land; peach, rolling, well-drained land, with a northern exposure.

Soil: Have not as yet settled the question of character of soil.

The preparation before planting should be good, as for corn.

Time of planting: Should be in April.

Distances to plant: Apple, in rows two rods apart one way, and one the other; peach, in rows one rod apart one way, and half a rod the other, and thin out alternate trees, when ever they interfere.

Cultivation: Shallow plowing, sufficiently often to keep down weeds, until August, and hoe out the rows. Mulching with old hay is preferable to hoeing for the rows.

Pruning: Apple, should be done, to secure a symmetrical head, two to three feet from the ground, and remove all interfering limbs in June and July; peach, prune only to facilitate approach to the tree for gathering fruit; cherry, treat same as the apple.

Wind-breaks, constructed on the south side of orchards and gardens, of the cottonwood and peach, in rows 8 feet apart, and 2 to 4 feet in the rows, have been an advantage. These should be kept free from weeds by plowing.

Preferred list for family uses: Apple and pear—Not sufficiently tried to determine. Peach—Seedlings generally, but the Crawford's Early, Troth's Early Red, Alexander, Yellow Alberge, Stump the World, have produced fine fruit. Plums—None but native varieties have been productive. Cherry—Early Richmond; scarcely any other variety grown.

SMALL FRUITS.

Date of first planting: Blackberry, gooseberry and raspberry in 1873, currant and strawberry in 1874, by J. W. McLaren, Summerville.

Location preferable: Blackberry, gooseberry and raspberry, a northern exposure; currant, shaded, cool, and damp.

Soil most productive: Blackberry, gooseberry and raspberry, upland sandy loam; strawberry, rich prairie upland.

Preparation of soil: Before planting, prairie should be broken and thoroughly pulverized as deep as practicable, for two years.

Time for planting: As early in the spring as practicable.

Cultivation necessary: Thorough and frequent during the first year, and mulching thereafter.

Pruning: Blackberry—Cut back the canes in July and August to 30 inches high; keep walks clear of weeds by cultivation or mulching. Raspberry—Head back canes at 2 feet high, and shorten in the lateral growth.

List of varieties established as reliably productive, in the order of value: Blackberry, Kittatinny and Wilson's Early; gooseberry, Houghton; raspberry, native blackcaps, Doolittle, McCormick; strawberry, Wilson's Albany.

The one variety most satisfactory, in plant and productiveness: Blackberry, Kittatinny; gooseberry, Houghton; raspberry, native blackcap.

Mulching has been an advantage in summer and winter.

VINEYARDS.

Date of first planting: In 1876, by Andrew Spence, Minneapolis.

MISCELLANEOUS NOTES.

The extent of planting of all classes in 1880 was equal to that of 1879, excepting the peach, which was about one-half, and the blackberry more than double.

The present condition of the horticultural investments is promising, and the interest is general among the people.

OSBORNE COUNTY.

BY M. MOHLER, OSBORNE.

ORCHARDS.

Date of first planting: Apple and peach in spring of 1873, cherry in 1875, by M. Mohler, of Osborne.

Experience of the past years has determined that with proper care, apple trees can be grown in this locality. Pear trees grow very well, but are short-lived. Cherry trees succeed.

Soil: Upland is considered the most desirable for apple, and most any of our soils for the peach and cherry.

Preparation of soil: Should be thoroughly subdued by deep plowing and successive stirring.

Planting: The most successful growers obtain the trees in fall, bury them, and set early in spring.

Distances: Apple, 25 feet apart each way; peach 10 feet, and cherry 15 feet apart each way.

Cultivation: Experience has proved mulching to be preferable to stirring the ground.

Pruning: Very little done. Trees are grown with low heads generally.

Wind-breaks, as a protection, have been an advantage when located on the north and south sides. Cottonwood, box elder, maple, Osage orange, and sometimes peach trees, have been successfully used.

For a family apple orchard of 100 trees, would select for summer, 5 trees; autumn, 15; winter, 80. As to proper varieties, that has not been determined.

SMALL FRUITS.

Date of first planting, in 1873, by M. Mohler, of Osborne; all classes were set and all but blackberries failed; they are doing well. Grape-vines grow well, but do not know of their fruiting in the county.

The planting in 1879 was so near a failure, that very light planting was done in 1880; but the interest in tree planting is strengthening, and confidence in the ultimate success of horticultural investments, still exists among the settlers of the county.

PAWNEE COUNTY.

BY C. C. CHEVALIER, GARFIELD.

ORCHARDS.

Date of first planting: Apple in 1874, by John Adams, of Larned; pear and cherry in 1875, by C. C. Chevalier, Garfield; peach and plum in 1874, by R. B. Gee, Garfield.

Date of first fruiting: Apple in 1878, by John Scott, Larned; peach in 1877, by C. C. Chevalier, Garfield; plum and cherry in 1877, by W. H. Gill, Larned.

From the experience of the past years, the most desirable location for all classes of orchard fruits is a northern slope.

Preparation of land for fruit-tree planting: Heretofore there has been too much haste to start an orchard. The land has not been properly prepared; hence many failures have occurred. We have now an older and much better condition of the land, and planters are subsoiling 12 to 15 inches deep, which is found to pay well with a kitchen garden, and especially for all kinds of trees.

All classes may be planted in autumn or early spring if the ground is sufficiently moist.

Plant apple trees in rows 33 feet apart, and in the rows 20 feet. Midway between the rows plant a row of peach trees, 10 feet apart in the row. In the apple-tree rows, alternate with peach trees. This method of planting will locate the apple trees 33 feet by 20. The peach trees planted between them, being short-lived, will be ready to cut out by the time the space is needed. They are planted for the purpose of affording a form of wind-break for the orchard, as well as for their fruit. Peach, plum and cherry, alone, plant 16½ feet each way.

Cultivation should be thorough, and during the spring and summer, and not later than August 1st.

Pruning: All fruit trees should be formed with low heads. Prune in June.

Wind-breaks have been an advantage to orchards and gardens, when located on the north and south sides. Construct in rows 6 to 8 feet apart, and from one to four feet in the row. Cultivate each year until the trees are sufficiently large to shade the land.

In an orchard of 100 apple trees for family purposes, would recommend the following list, and numbers of each to plant: Summer, 3 Early Harvest, 2 Carolina Red June; autumn, 5 Maiden's Blush, 3 Lowell, 2 Fall Wine; winter, 30 Ben Davis, 30 Winesap, 15 Rawles Genet, 10 Jonathan.

SMALL FRUITS.

Date of first planting: Blackberry, currant, gooseberry and raspberry, in 1874, strawberry in 1875, by W. H. Gill, Larned.

All small fruits should have a protection on the south.

They have done well on both bottom and upland.

Prepare land for small fruits by deep plowing, from 12 to 15 inches deep.

Plant blackberry in the fall, if the ground is moist; all the others, early in spring. Blackberry and raspberry, in rows 8 feet apart, and 2 feet in the rows; currant, in rows 4 feet apart, and 3 feet in the row; gooseberry, 4 feet each way.

Cultivation: Keep the ground clear of weeds.

Pruning: Blackberry, cut back the canes in latter lart of summer, to one foot in height; gooseberry, prune to a tree form; raspberry, cut out the dead wood.

List of varieties planted: Blackberry, Lawton and Kittatinny are not hardy here; am trying the Snyder. Currant, White Grape, White Dutch, and Cherry; gooseberry, Houghton, Smith, and Downing; raspberry, Doolittle and Gregg; strawberry, Wilson's Albany.

Mulching is an advantage to strawberry, and manure should be applied three or four inches deep on the surface, for a dressing.

VINEYARDS.

Date of first planting: In 1874, by R. B. Gee, of Garfield.

Ground for a vineyard should be subsoiled 12 to 15 feet deep.

Plant strong, one-year-old plants, in rows 8 feet apart, and 6 feet in the row.

Cultivate during the early part of summer.

Train to stakes. I think what is called "stump pruning," the California style, will succeed here.

The Concord, Clinton and Ives are preferable for family use, and the Concord for market.

The extent of planting in 1880 was very light, owing to prevailing drouth.

Considering the adverse conditions for the past two years, trees are looking remarkably well, and very encouraging. There is quite an extensive interest in the pursuit of horticulture among the people.

POTTAWATOMIE COUNTY.

BY JOSEPH LEACH, HAVENVILLE.

ORCHARDS.

Date of first planting: Apple and peach, in 1862.

Date of first fruiting: Apple in 1866 and peach in 1865, on the farm of O. O. Beach, of Havenville.

Location most desirable: Apple and peach, north and northwest slope. Not able to determine as yet for other classes.

Soil most productive: Upland prairie.

Preparation necessary: Such as is required to produce a good corn crop.

Planting season: Spring.

Distances: Apple, 30 feet each way.

Cultivation: Plant to corn or root crops until the orchard is five years old, then seed to clover.

Pruning-time: Young trees in summer, old trees in February.

Wind-breaks, located on all sides, are an advantage to an orchard or garden. Construct in rows 7 feet apart, and 4 feet in the row, and when the trees crowd upon each other, thin out. Cultivate until trees are large enough to shade the land sufficiently to keep down weeds. Cottonwood and soft maple have been used successfully.

List of varieties, in the order of their value and productiveness—*For family purposes:* Apple—Rawles Genet, Ben Davis, Winesap, Maiden's Blush, Red Astrachan, Fameuse, Willow Twig. Peach—Amsden's June, Crawford's Early, Early York, Crawford's Late. *For market purposes:* Apple—Ben Davis, Rawles Genet, Winesap, Willow Twig, Jonathan.

List of varieties, and proportions of each, for a family orchard of 100 trees: Apple—Summer, 4 Red Astrachan, 4 Early Harvest, 4 Summer Rose; autumn, 4 Maiden's Blush, 4 Rambo, 2 Lowell, 4 Fameuse, 4 Gramar Pearmain; winter, 20 Ben Davis, 10 Winesap, 15 Rawles Genet, 10 White Winter Pearmain, 10 Grimes's Golden, 5 Willow Twig.

List of varieties, proportions of each, named in the order of profit, most reliable for a market orchard of 1,000 trees: Apple—200 Ben Davis, 150 Winesap, 165 Rawles Genet, 150 White Winter Pearmain, 100 Lansingburgh, 100 Willow Twig, 100 Grimes's Golden, 15 Maiden's Blush, 10 Summer Rose, 10 Sops of Wine.

SMALL FRUITS.

Date of first planting, in 1873.

Soil most productive: Rich prairie.

The Kittatinny blackberry, Red Dutch currant, Pale Red gooseberry and Doolittle raspberry afford the most satisfactory results in plant and fruit.

Manuring of small fruits has been profitable.

MISCELLANEOUS NOTES.

The extent of planting in 1880 was greater than in 1879.

The results of the past years have been sufficiently satisfactory to warrant an extended investment in the future. The interest and confidence in the pursuit are general among the people.

RENO COUNTY.

BY A. S. DIMOCK, HUTCHINSON, AND B. P. HANAN, LANGDON.

ORCHARDS.

Date of first planting: Apple in 1873, by C. Walter, of Hutchinson; pear in 1874, peach in 1872, cherry in 1873, by A. S. Dimock, of Hutchinson.

Date of first fruiting: Apple in fall of 1875, on the farm of C. Walter, of Hutchinson; peach in 1875, cherry in 1876, on the farm of A. S. Dimock, Hutchinson.

Location most desirable: High, well-drained land.

Soil most productive: Any class not too sandy, or containing too much alkali, ("gumbo.")

Preparation necessary: Plow deep and pulverize thoroughly. Thin, sandy land should be enriched with well-rotted manure.

Planting season: Early spring for all classes.

Distances: Apple—Set in rows, 25 feet each way. Prefer the quincunx style, as it affords more room to each tree. Set trees 2 inches deeper than they stood in the nursery rows. Pear—Standards 18 feet each way, dwarf 10 to 12 feet. Peach—16 feet each way. Cherry—Same as peach.

Cultivation necessary: The first year plant to corn, and cultivate as will be necessary to produce a good crop, but not later than 20th of July. Through the next three years plant and cultivate in beans.

Pruning season and system: For fruit, prune in June and July; for wood growth, in February and March, when the wood is not frozen. Form low heads, and remove all limbs liable to chafe or cross. This applies to all classes except the peach, which should be pruned in June.

Wind-breaks, located on the north, south and west, have been a great advantage to orchards and gardens. Constructed in belts 30 feet wide, containing 5 or 6 rows, and 4 feet in row, so arranged as to break all spaces between the trees in the rows. Allow the branches to form near the ground. Cultivate at least three years after planting, but not later than July 20th each year. Cottonwood, elm, and Russian mulberry have been used successfully. Red cedar, when once established, proves to be one of the best.

Of apples, the Maiden's Blush and Ben Davis are the only varieties which have fruited; peaches, Crawford's Late and Heath Cling. Some very fine seedlings, originating with A. S. Dimock, are promising. Cherry, Early Richmond.

SMALL FRUITS.

Date of first planting: Blackberry in 1873, by J. S. Barter; gooseberry in 1873, strawberry in 1872, by A. M. Switzer, both of Hutchinson.

Location preferable: On all kinds; the strawberry succeeds on rich bottoms.

Soil most productive: A black, moist sandy loam.

Preparation necessary: Deep plowing and thoroughly pulverized; unless naturally rich, should be made so by manuring. An application of wood ashes is desirable for gooseberries.

Planting season: Blackberry, fall or very early spring; currant, gooseberry and raspberry, early spring; strawberry, early fall and spring.

System: Blackberry in rows 8 feet apart, and 4 feet in the row; gooseberry and raspberry in rows 5 feet apart, and 3 feet in the row; strawberry, in rows 4 feet apart, and 12 to 18 inches in the rows.

Cultivation necessary: Thorough, but shallow plowing and hoeing, through the season.

Pruning: Blackberry and raspberry, shorten in the canes to three or four feet in height, and laterals at about twelve or fifteen inches; gooseberries, take out all old and feeble wood.

List of varieties reliably productive, in the order of their value: Blackberry, Kittatinny; gooseberry, Houghton; raspberry, Turner; strawberry, Wilson's Albany, Col. Cheney, and French's Seedling. The Kittatinny blackberry, Houghton gooseberry, Turner raspberry and Col. Cheney strawberry afford the most satisfactory results in plant and fruit.

Mulching has been an advantage, both in summer and winter.

Manuring is profitable on thin soil; should be applied on the surface before spring rains, and lightly worked into the land.

VINEYARDS.

Date of first planting: Spring of 1873, by George Cole, of Hutchinson.

Location: Evidence points to bottom land.

Soil most productive: Most any of the well-drained lands.

Preparation necessary: Deep plowing and thoroughly pulverized.

System: On level ground, *i. e.*, not ridged in preparation, and in rows 8 feet apart each way. Use strong, one-year-old plants.

Train to trellises, running north and south. Success has been obtained by allowing the vines to run on litter placed under them as a mulch. Prune fore part of March.

Cultivation should be shallow, and in spring and summer, to keep down weeds, and again late in autumn, just as freezing weather commences.

Varieties most successful: Concord, Hartford Prolific, Delaware, and Ives. The first is most valuable for market purposes.

Location most desirable: Hillside, with an eastern or western exposure.

MISCELLANEOUS NOTES.

The extent of planting in 1880 was much less than in 1879.

There is a strong disposition to persevere in the work of determining a successful system for growing fruits, among the intelligent classes of settlers in this county.

RICE COUNTY.

BY J. B. SCHLICHTER, STERLING.

ORCHARDS.

Location most desirable: Apple and peach, northeast slope.

Soil most productive: Apple, deep loam with a sub-stratum of sand; peach and cherry, sandy loam; plum, for native varieties the more sandy the better are the results.

Preparation: For apple and peach, deep plowing and subsoiling. On uplands, open a deep furrow, and on wet land, ridge up where the row of trees is to stand.

Planting season: Peach in autumn, if the ground is moist; all other classes in spring.

Method and distances: Apple—In an open furrow, in rows 20 feet apart. Some prefer the quincunx form, this consists of five trees, one at each corner, and one in the center of a square. It gives a regular grove of trees with rows and alleys running in every direction. Pear, in same form, 10 feet apart in the rows for dwarfs, and 16 feet for standards. Peach, seedlings, 6 feet apart, budded varieties 10 feet; plum 10 feet and cherry 12 feet.

Cultivation: Apple and pear, plant with corn until trees are sufficiently large to protect each other; peach and plum, thorough during fore part of the season, for a couple of years; cherry, same as for apples. (NOTE.—In this county, a thoroughly-loosened surface by cultivation, is more desirable than mulching.)

Pruning: When trees are young and in the growing season, form the heads about 2 feet from the ground. The peach should have its strong-growing branches shortened when two or three years old.

Wind-breaks are an indispensable, and should be located on the south and west sides of an orchard. Construct in rows, 4 to 8 feet apart, and if cuttings are to be used, set 1 foot apart in rows; if young trees, from 2 to 4 feet. Give them thorough culture and very little pruning. Use cottonwood in the two outside rows, walnut next, and two or three rows inside, of box elder, honey locust, catalpa, or Russian mulberry.

SMALL FRUITS.

Date of first planting, 1872, of all classes, by this reporter.

Location preferable: Blackberry, raspberry, north slope; gooseberry, in the shade; strawberry, low, damp land, well drained—must be irrigated.

Soil most productive: Clay loam.

Preparation: Deep plowing in fall or winter, and harrowing in early spring, and roll if inclined to be very loose.

Planting should be done in spring—blackberry, in rows running north and south; if root sections, drop 1 foot apart in the row; if young plants, set 2 feet apart. Raspberry, in rows 4 feet apart.

Cultivation: Deep and thorough, following the fruiting season.

Pruning: Cut back the growing canes at 2 to 3 feet high, and the lateral growth at one foot from the cane.

List of varieties reliably productive, in the order of value: Blackberry, Kittatinny; gooseberry, Houghton; raspberry, McCormick and Doolittle.

Mulching is an advantage in winter; good cultivation of the land is better in summer.

Manuring by top-dressing in autumn or early spring, is profitable.

MISCELLANEOUS NOTES.

The results so far do not afford very much encouragement for extensive investments.

RILEY COUNTY.

BY T. C. WELLS, MANHATTAN.

ORCHARDS.

Date of first planting: Of all classes, in 1857, by John Kimball, Manhattan

Location most desirable: High land, with a northern slope, and if near a body of water or lowland, the better.

Soil most productive: Soil that is good, deep, well drained, which would produce a good crop of corn, is desirable for an apple orchard; for pear, rather poor, dry soil; peach, plum and cherry require the same as apple.

Preparation: Should have been broken up long enough to secure a well-rotted condition of the sod; then it should be deeply, thoroughly plowed and pulverized.

Planting season: Early spring, for all classes.

Distances: Apple, 30 to 35 feet each way. Method: Set stakes around the outside of the plat of land to be planted, at a point marking the distance of each row; with a plow run a straight furrow from each stake to its opposite across the plat each way. This will check the land, and at points of intersection set a tree. Dig large, deep holes. Spread all roots in a natural position; draw in fine, mellow earth, and press down firmly upon the roots. In handling the trees, do not expose the roots to sun or air any longer than is absolutely necessary to perform the work. Pear, 24 feet each way; plum and cherry, 15 to 20 feet.

Cultivation: Apple, plum and cherry—Plant corn or other hoed crops among the trees, until they are large enough to fruit. Avoid cultivation late in the season. If the land will not produce a good crop of corn without manure, then apply the amount necessary. Pear should not be cultivated as highly as the apple, and requires no manure. Peach, same as for apple, but would not grow any other crop on the land after they come into fruiting.

Pruning-time: Mild days in winter.

System: Cut out all water sprouts and limbs that chafe; keep the head well balanced and properly thinned out. Heads should be formed from two two to three feet from the ground.

Wind-breaks, located on the southwest and north, constructed three to four rods from the outside row of the orchard, in rows 8 to 12 feet apart, and 4 feet in the row, are beneficial. Prefer box elder, but soft maple, cottonwood and black walnut have all been used successfully. Cultivation should be such as is required to subdue weeds and maintain a healthy wood growth.

List of varieties, in the order of value and productiveness—*For family purposes:* Apple—Summer, Early Harvest, Carolina Red June, Hightop Sweet (syn. Sweet June); autumn, Maiden's Blush, Lowell, Talman's Sweet; winter, Winesap, Jonathan, White Winter Pearmain, Rawles Genet, Rome Beauty, Broadwell. Pear—Louise Bonne de Jersey, Flemish Beauty, Bartlett, Seckel. Peach—Stump the World, Hale's Early, Crawford's Early, and select seedlings. Plum—Miner, and native varieties. Cherry—Early Richmond, English Morello, common Morello. *For market purposes:* Apple—Winesap, Ben Davis, Rawles Genet, White Winter Pearmain, Jonathan, Rome Beauty, Lowell, Maiden's Blush, Early Harvest, Sops of Wine. Pear, peach, plum and cherry, the same as for family purposes.

List of varieties, and number of each, for a family orchard of 100 trees: Apple—Summer, 5 Early Harvest, 5 Carolina Red June, 2 Hightop Sweet; autumn, 5 Maiden's Blush, 5 Lowell, 5 Rambo, 2 Talman Sweet; winter, 20

Winesap, 5 Jonathan, 10 White Winter Pearmain, 15 Rawles Genet, 10 Rome Beauty, 3 Broadwell, 3 Ortley, 5 Ben Davis.

List of varieties, and number of each, named in the order of profit, most reliable for a market orchard of 1,000 trees: Apple—250 Winesap, 150 Ben Davis, 150 Rawles Genet, 100 White Winter Pearmain, 100 Rome Beauty, 50 Jonathan, 50 Maiden's Blush, 50 Lowell, 25 Early Harvest, 25 Carolina Red June, 20 Rambo, 20 Ortley, 10 Broadwell.

SMALL FRUITS.

Location preferable: Northern slope or partial shade for all classes, excepting perhaps the strawberry.

Soil most productive: Blackberry, not very rich; currant, gooseberry and strawberry, deep, rich and rather moist; raspberry, same as for the currant, though not quite so rich.

Preparation: Such as required to produce a crop of corn. For currant, gooseberry, raspberry and strawberry, deep, thorough plowing, and pulverizing.

Planting season: Early Spring.

System: Blackberry, in rows 8 feet apart, and 3 feet in row; currant and gooseberry, in rows 8 feet apart, and 4 feet in row; raspberry, in rows 6 or 8 feet apart, 3 feet in row; strawberry, in rows 3 to 4 feet apart, 1 foot in the row. Allow them to mat in the row.

Cultivation: Blackberry and raspberry—Keep down the weeds by constant cultivation from early spring until July 1st, and if weeds trouble after that, mow them. Currant and gooseberry—Deep, to keep soil clear of weeds and mellow through the season, or mulch heavily. Strawberry—Keep down weeds and the ground mellow at all times during the growing season.

Pruning: Blackberry and raspberry—Cut off the new canes at 3 feet from the ground; remove old canes in the spring before buds break. Currant and gooseberry—Thin out the growth, to allow light and air to reach the fruit.

List of varieties reliably productive, and in the order of their value: Blackberry, Kittatinny, Snyder; currant, uncertain—Red Dutch and White Grape are the best; gooseberry, Houghton, Pale Red; raspberry, McCormick, Doolittle; strawberry, Hovey's Seedling, Chas. Downing, Kentucky, Wilson's Albany.

The one variety which affords the most satisfactory results in plant and product: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Pale Red; raspberry, McCormick; strawberry, Hovey's Seedling, with some other variety as a fertilizer.

Manuring is not necessary on good soil.

VINEYARDS.

One-year-old plants are most suitable for setting.

Cultivation should be shallow and in early spring.

Training and pruning: The renewal system, viz., grow two or more canes each season, and cut out all that have borne fruit the year before.

List of preferred varieties, in the order of success, for family use: Concord, Delaware, Catawba, Goethe, Agawam; for market, Concord, Dracut Amber, Catawba, Hartford Prolific.

The results of the past years warrant extended investment in this industry in the future. The interest and confidence in the pursuit are general.

RUSSELL COUNTY.

BY W. A. LEWIS, RUSSELL.

ORCHARDS.

Date of first planting: Apple in May, 1873, by B. Pratt, H. Swift, J. Yoxall, and S. Mann; pear and plum in December, 1876, by W. A. Lewis; peach in fall of 1873, by Asa Kinney; cherry in spring of 1876, by B. Pratt; —all of Russell.

Date of first fruiting: Apple, by J. Yoxall, in 1880; peach by Asa Kinney, in 1878; plum by B. Pratt, in 1879; cherry, by H. W. Lustau, in 1876; —all residing near Russell.

Location most desirable: Upland prairie, having a north or northeast slope.

Soil most productive: Peach and cherry, sandy loam; plum, clay loam. Cannot determine as yet for apple and pear.

Preparation necessary: Deep and thorough plowing and pulverizing, to destroy its wild nature. Would recommend the opening of a hole 3 feet across and 2 feet deep, and bottom to be filled in with the surface earth on which to set the tree.

Planting season: Apple and pear in fall or open weather in winter; peach, in spring; plum and cherry in fall.

Method, distances, etc.: Apple, in rows 30 feet each way; midway of the rows running north and south, alternate as follows: 1st, A dwarf pear, plum or cherry; 2d, peach; 3d, standard pear; 4th, peach; 5th, dwarf pear, plum or cherry. Each tree will be 7½ feet apart, and 15 feet distant from either apple-tree row. In the apple-tree rows, I would alternate as follows: 1st, an apple tree; 2d, peach; 2d, dwarf pear, plum or cherry; 4th, peach, and 5th, an apple. By this plan the land is completely used for the production of fruit, and being so closely planted, form a natural protection. By the time the trees would interfere, the peach trees will have passed their prime, and can be taken out. This will leave the balance of the trees 15 feet apart, and as dwarf trees are short-lived, they will be played out in time to prevent any interference by the growth of the apple, and should be removed. Then we shall only have the rows of apple, 30 feet apart each way, and in the center of the square formed by each four apple trees a standard pear tree.

Cultivation: Plow north and south as closely as possible to the trees without incurring injury, as early in the spring as the ground will work nicely, and pulverize thoroughly with a harrow. Keep weeds down by frequent use of the harrow and hoe.

Pruning: Cannot recommend heavy pruning, only sufficient to balance the head, and remove interfering limbs.

Wind-breaks, located on all sides, are beneficial to an orchard and garden. Construct in rows, 1 rod apart and 2 feet in the row, and thin out as required by the growth. Cultivate well, to keep down the weeds and maintain a vigorous growth. The cottonwood, box elder and white willow have been successfully used.

SMALL FRUITS.

Date of first planting, blackberry, currant, and raspberry, in December, 1876, by W. A. Lewis; strawberry, in March, 1876, by A. B. Cornell and B. Pratt;—all residents of Russell.

Location and soil: Have tried only upland soil, which is a clay loam.

Preparation: Such as is needed for a corn crop.

Planting season: Spring is preferable.

System: Blackberry, gooseberry, raspberry and strawberry, in matted rows; currant, in hills, on the north side of some protection from the sun.

Cultivation: Very little. Mulch is more beneficial.

Pruning: Blackberry, cut back canes to 2 feet high, and shorten in laterals; currant and gooseberry, very little needed; raspberry, keep low in hedge form.

List of varieties reliably productive, and in the order of value: Blackberry, Kittatinny, Snyder, Lawton; currant, Red Dutch; raspberry, Turner and native blackcaps; strawberry, Kentucky.

The Kittatinny blackberry, Red Dutch currant, Turner raspberry and Kentucky strawberry afford the most satisfactory results, in plant and fruit.

Mulching is indispensable, in summer and winter.

Manuring is not necessary upon our virgin soil.

VINEYARDS.

Date of first planting: December, 1876, by W. A. Lewis, Russell.

Location most desirable: Only a west and southwest exposure, on upland prairie, has been tested as yet.

Soil—preparation: Good plowing and pulverizing.

Training and pruning: In rows 8 feet apart, and 6 feet in the row. Prune to a single stem 2 feet high, and from the top grow arms for fruiting, in the style practiced in California. Train to stakes.

Cultivation: Thorough in spring, and mulch the balance of the year.

The Concord is preferred.

MISCELLANEOUS NOTES.

The extent of planting in 1880 was very light compared with that of 1879. Where well cared for, the investments are encouraging, and warrant future efforts. There is a general interest and confidence in the pursuit among the people.

BY J. B. CORBETT, BUNKER HILL.

The continuous drouth of 1880 seriously interfered with tree planting and tree growth in this part of Russell county. In most cases, the fruit trees planted in the spring of that year, died. Those that did live, and trees that were planted in former years, made but slow growth. I saved my spring planting by watering the roots effectually at the time of setting. Out of 400 apple and 250 cherry trees planted in that way, on ground that had been plowed very deep in the fall, I saved all but twenty. After the September rains set in, these made a commendable growth, and seemed to be in a thrifty condition at the setting-in of the present winter. Those who took no special care of their trees and vines, report an almost complete failure. I am satisfied that with good wind-breaks and proper care, as a rule, fruit trees and vines can be cultivated successfully in this county, but it will be some years yet before this branch of industry will receive the attention it demands from the farmers of this county.

SALINE COUNTY.

BY H. A. NORTHRUP, SALINA.

ORCHARDS.

Date of first planting: Apple, in 1864, by Mr. Webster, Salina.

Date of first fruiting: In 1869, on the farm of W. W. Peck, Salina.

Location most desirable: Upland.

Soil most productive: Any well drained.

Preparation: Thoroughly subdued by deep plowing.

Planting season: Apple and pear, autumn; peach, plum and cherry, in spring.

Distances: Apple, 33 feet apart each way, and alternate with peach trees; all the other classes should be 1 rod apart each way.

Cultivation: Shallow plowing in fall; cultivate early and often until August 1st each year.

Pruning: Apple and pear, during mild weather in winter; peach, shorten in the season's growth in fall.

Wind-breaks, located on the south, are an advantage to orchards and gardens. Construct in rows 10 feet apart, and trees 2 to 4 feet in the row; cultivate thoroughly, or maintain a heavy mulch during the first three or four years; protect against fires. Cottonwood has the preference for such purposes.

List of varieties which have been productive, named in the order of their value: Apple—Early Harvest, Maiden's Blush, Winesap, Ben Davis, Rawles Genet, Willow Twig, Yellow Bellflower. Pear—Bartlett, Duchesse d'Angouleme, Brandywine. Peach—Amsden's June, Alexander, Early Beatrice, Crawford's Early, Hale's Early, Troth's Early Red. Plum—Wild Goose and Miner. Cherry—Early Richmond, common Morello, English Morello, May Duke.

List of varieties, and number of each to plant, in a family orchard of 100 trees, for family use: Apple—Summer, 10 Early Harvest; autumn, 10 Maiden's Blush and 10 Rambo; winter, 20 Missouri Pippin, 20 Ben Davis, 20 Winesap, 10 Rawles Genet.

SMALL FRUITS.

Location preferable: Blackberry, deep and well drained; raspberry, for all varieties upland prairie, for blackcaps bottom land; strawberry, bottom lands.

Soil most productive: Blackberry and gooseberry, deep, sandy loam, and the same for red raspberries, and rich bottom for blackcap varieties; strawberry, rich bottom land.

Preparation: Very deep plowing, subsoiling, if possible.

Planting season: Blackberry, autumn; raspberry, red varieties in the fall, black in spring; strawberry, in the spring.

System: Blackberry, open deep furrows with a turning-plow, (running twice in the same furrow,) 6 feet apart, in which drop the plants 2 feet apart, set them up and cover the roots with a hoe; then close up the furrow with a double-shovel plow. A single run of the plow will open a sufficient furrow for gooseberry and raspberry; and for strawberry, open light furrows with a shovel plow, 3 feet apart, and set plants 16 feet in the rows.

Cultivation: Thorough during the first year, and during winter keep heavily mulched. Cease cultivation by August 1st for all classes except the strawberry, which should be cultivated throughout the season, and lightly mulched during winter.

Pruning: Blackberry and raspberry, treat similar to a hedge during the growing season, holding the growth at about three feet high; gooseberry, thin out old and weakly shoots in fall.

List of varieties reliably productive, named in the order of their value: Blackberry, Kittatinny; gooseberry, Houghton; raspberry, McCormick (syn. Mammoth Cluster); strawberry, Charles Downing.

Mulching has been an advantage to newly-set plants and for strawberries.

Manuring has been profitable with blackberry, raspberry, gooseberry and strawberry; set on land not naturally rich, as a surface-dressing, and worked in.

VINEYARDS.

Date of first planting: In spring of 1870, by Robert Anderson, of Salina.

Location most desirable: Elevations.

Soil most productive: Sandy loam.

Preparation: Deep plowing.

Planting: In rows 12 feet apart each way, and if the soil is heavy, open holes 4 feet across and 2 feet deep; mix coal ashes with the dirt, near the bottom, and fill up with good surface soil. Plant shallow, using two-year-old plants. Cultivate from early spring to August 1st.

Prune with long arms and spurs; train to trellises.

For family use, the Concord, Ives and Clinton have been most successful.

MISCELLANEOUS NOTES.

The planting in 1880 was very light, of all classes.

The present condition of horticultural investments is good, and for home purposes, offer sufficient encouragement for a continued effort.

SEDGWICK COUNTY.

BY WM. M'CRACKEN, SUNNY DALE.

ORCHARDS.

Date of first planting: In spring of 1873 for all classes, by Wm. McCracken, Sunny Dale.

Date of first fruiting: Apple in 1877, pear in 1878, peach in 1875, plum in 1876, on the farm of this reporter.

Location preferable: Apple, south, east, and southeast slope; pear and peach, southeast slope; plum and cherry, southeast and east slope.

Soil most productive: Apple and pear, sandy, with porous subsoil; peach, sandy; plum, clay; cherry, warm sandy.

Preparation necessary: Ordinary plowing for all classes.

Planting season: Apple and pear, first of April; peach, February or March, as the weather permits; plum and cherry, in March.

Method and distances: Apple, 30 feet apart; peach, alternate with the trees in the apple orchard, and if in a separate lot, then in rows 15 feet apart and 12 feet in the row; pear, 20 feet each way; plum and cherry in rows 15 feet apart and 10 feet in the rows. All classes should be planted shallow, and dirt closely packed among the roots.

Cultivation: Plow in spring, and plant to corn, always turning the dirt to the trees, for all classes.

Pruning: None until the sixth year after planting. Then thin out the head, of all classes except the cherry, in June, which should not be pruned until the trees commence to fruit.

Wind-breaks are of some benefit. Cottonwood and locust planted in the orchards so as to alternate with fruit trees, afford the best protection.

List of varieties, in the order of their value and productiveness—*For family purposes*: Apple—Yellow June, (syn. White June,) Early Harvest, Maiden's Blush, Rambo, Missouri Pippin, Rawles Genet, Limber Twig. Pear—Bartlett, Belle Lucrative, Louise Bonne de Jersey, Duchesse d'Angouleme. Peach—Hale's Early, Amsden's June, Alexander, Chinese Cling. Plum—Chickasaw, Wild Goose, Blue Gage, Sand. Cherry—Plumstone Morello, Early Richmond, Late Richmond, Gov. Wood. *For market purposes:* Apple—Ben Davis, Rawles Genet, Missouri Pippin, Winesap, Talman's Sweet. Pear—Bartlett, Duchesse d'Angouleme, Louise Bonne de Jersey. Peach—Hale's Early, Amsden's June, Alexander, Smock, Chinese Cling, Heath Cling. Plum—Chickasaw, Sand, Blue Gage, Wild Goose. Cherry—Plumstone Morello, Early Richmond, Gov. Wood, Late Richmond.

List of preferred varieties, and proportions of each, for a family orchard of 100 trees: Apple—Summer, 5 Carolina Red June, 5 Yellow June, 2 Early Harvest, 2 Red Astrachan, 2 Tetofsky, 2 Golden Sweet, 2 Keswick Codlin; autumn, 2 Bailey's Sweet, 10 Maiden's Blush, 10 Rambo, 5 Fall Genneting, 3 Fall Pippin; winter, 10 Missouri Pippin, 10 Ben Davis, 10 Rawles Genet, 5 Talman's Sweet, 10 Winesap, 5 Grimes's Golden.

List of varieties, named in the order of profit, and the proportions of each, for a market orchard of 1,000 trees: Apple—100 Missouri Pippin, 100 Ben Davis, 100 Winesap, 100 White Bellflower, 100 Rawles Genet, 100 Gilpin, 100 Kentucky Redstreak, 50 Talman's Sweet, 50 Grimes's Golden, 50 Yellow Bellflower, 50 Northern Spy, 50 Limber Twig, 50 Milam.

SMALL FRUITS.

Date of first planting of all classes: Spring, 1873, by this reporter.

Location preferable: Blackberry, eastern slope; currant and gooseberry, southern slope; raspberry and strawberry, southeastern slope.

Soil most productive: Blackberry, gooseberry and raspberry, sandy; currant, damp soil; strawberry, damp clay soil.

Preparation: An ordinary plowing and harrowing for all classes.

Planting-time: Blackberry, autumn; currant, gooseberry, raspberry, in spring; strawberry, in June.

System: Plant among fruit trees, excepting currants, which must be in some shady place other than that afforded by trees.

Cultivation necessary: Blackberry and raspberry, same as for corn, the first year; afterward none is needed; currant and strawberry, heavily mulched; gooseberry, ordinary care.

Pruning: Blackberry, very little; other classes, none.

List of varieties reliably productive, named in the order of value: Blackberry, Lawton and Kittatinny; currant, Red Dutch; gooseberry, Houghton and Limber Twig; raspberry, Philadelphia, Kansas blackcaps; strawberry, Wilson's Albany.

The one variety which affords most satisfactory results, in plant and product: The above named, except Houghton gooseberry.

Mulching has been an advantage both in summer and winter.

Manuring of all classes is profitable; should be spread so as to cover the entire surface of ground, in the fall.

VINEYARDS.

Date of first planting: Spring of 1873, by this reporter.

Location most desirable: South and southeast slope.

Soil most productive: Black, sandy loam.

Preparation: In ordinary manner.

Distance: In rows 6 to 8 feet apart. Two-year-old plants are preferable.

Cultivation: Common during the first two years, then mulch, so as to keep weeds from growing.

Training: Allow them to run on the ground the first two years, then tie to stakes.

List of preferred varieties, in order of their success: For family use, Concord, Catawba, and Isabella; for market, Concord, Catawba, and Fox.

MISCELLANEOUS NOTES.

The extent of planting in 1880 of apple, pear, peach, strawberry, fifty per cent. less than in 1879; of other classes about the same.

The present condition of horticulture is good, and the results of past years warrant extended investments in the future. The interest and confidence of the people of this county in fruit growing is general.

(NOTE.—The methods of treatment of fruit trees and plants adapted to the eastern portion of this State are not successful in this section, hence the difference which has been herein stated. The results of past years' experience warrant the treatment to be safe and successful in this county.)

SHAWNEE COUNTY.

BY THOS. BUCKMAN AND E. P. HARRIS, TOPEKA.

ORCHARDS.

Date of first planting: Apple, peach and cherry in the spring of 1872, pear in 1874, by Thos. Buckman, Topeka.*

Date of first fruiting: Peach in 1874, cherry in 1875, apple in 1877, on the farm of Thos. Buckman.

Location preferable: Apple, generally a northeastern slope. The most productive annual-bearing orchard in the county is on a western slope, surrounded with a heavy timber belt. Pear—High thin land; light cultivation; no manuring. Peach—High ground, sufficiently rich to secure a healthy but not too vigorous wood growth; southern slope. Cherry—Any location of a medium altitude; avoid such as are liable to late spring frosts.

Soil most productive: Apple, a deep black soil, having a porous clay or gravelly subsoil; pear, rather a poor soil, well underdrained; peach, high, dry, and gravelly; cherry, deep and rich.

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*Apple, by E. P. Harris, in 1856.

Preparation of soil: Deep and thoroughly pulverized. Apply a dressing of ashes or well-rotted manure. For pear, the reverse of that for the apple is most successful. Peach and cherry, the same as for apples.

Mulch with any substance that will keep the ground moist and cool.

Season for planting: Spring.

Distances: Apple, 30 feet each way—quincunx interferes with cultivation; pear, 20 feet each way; peach, 16 feet—set deep and keep the earth thrown up around the tree; plum, 12 feet each way; cherry, 16 feet each way, and set deep.

Cultivation: Apple—That which will produce a good corn crop for seven or eight years, then sow to clover. Rather poor land should be manured every fourth or fifth year. All culture should be done early in the growing season. Pear—The treatment should be such as to produce a slow growth. The application of cinders from a blacksmith shop is good around the tree. Peach—A clean culture every year that a plow can be run between the rows without injuring the fruit. Cherry, if not on the Morello sprout, cultivate well; otherwise sow to clover.

Pruning: Apple—April or May; remove all water sprouts, chafing and dead limbs; keep the head low and properly balanced; cut back leading branches. Pear—In spring, trim from top of the head, rather than from the under side. Peach—In spring, (April,) sparingly; keep the head low and balanced, by heading in any limbs that lead to the north, threatening to develop an uneven top. Cherry—In April; head low.

Wind-breaks, located on the southwest and northwest, composed of two to four rows of Osage orange, cottonwood and Lombardy poplar, 6 feet apart, and a hedge on the outside 12 feet distant, trimmed to 4 feet breadth and a thick hedge 16 feet high on the west, are a most decided advantage to the orchard and garden. These should be well cultivated the first five or six years, and then sown to clover.

List of varieties that have been productive, in the order of their value: *For family purposes:* Apple—Summer, Early Harvest, Carolina Red June, Yellow June, Cooper's Early White; autumn, Maiden's Blush, Rambo, Lowell, Grimes's Golden; winter, Winesap, Missouri Pippin, Rawles Genet, Ben Davis, Smith's Cider, White Winter Pearmain, Willow Twig. Pear—Bartlett, Seckel, Flemish Beauty. Peach—Hale's Early, Amsden's June, Alexander, Crawford's Early, Crawford's Late, Old Mixon Free. Plum—Wild Goose, Miner and Damson. Cherry—Early Richmond, Late Richmond, English Morello, May Duke, Gov. Wood. *For market purposes:* Rawles Genet, Ben Davis, Winesap, White Winter Pearmain, Smith's Cider, Willow Twig, Jonathan, Maiden's Blush, Grimes's Golden, Rambo. Peach—Hale's Early, Amsden's June, Crawford's Early, Crawford's Late, Heath Cling, Indian Blood Cling. Plum—Wild Goose, Miner, Damson. Cherry—Early Richmond, Late Richmond, English Morello.

Preferred varieties, and proportion of each, for a family orchard of 100 trees: Apple—Summer, 6 Early Harvest, 5 Carolina Red June, 4 Cooper's Early White; autumn, 10 Maiden's Blush, 4 Rambo, 4 Fameuse, 4 Grimes's Golden, 3 Jonathan; winter, 10 Winesap, 10 Rawles Genet, 10 Missouri Pippin, 10 Ben Davis, 10 Willow Twig, 10 White Winter Pearmain.

Preferred varieties, and proportion of each, for a market orchard of 1,000 trees, in order of profit: 200 Rawles Genet, 200 Winesap, 200 Ben Davis, 150 Missouri Pippin, 100 Smith's Cider, 50 Willow Twig, 30 Maiden's Blush, 30 Grimes's Golden, 10 Rambo, 10 Early Harvest, 10 Red Astrachan, 10 Early Pennock.

SMALL FRUITS.

Date of first planting: Currant, gooseberry and raspberry in 1872, blackberry in 1877, by Thos. Buckman, Topeka.

Location preferable: Blackberry, high prairie; currant, northern slope; raspberry, northern slope, well shaded; gooseberry succeeds in any.

Soil most productive: Blackberry, deep black; currant, cool, moist, and well shaded; gooseberry, on any kind; raspberry, loose and rich.

Preparation of soil: Should be thorough by deep plowing and harrowing, for all classes.

Time for planting: Early spring.

System for planting: In rows 5 and 6 feet apart, and 4 and 5 feet in the rows.

Cultivation: Should be thorough between the rows, with plow or cultivator.

Pruning: Blackberry—Head back the canes at 2½ feet from the ground, and the laterals 16 inches from the cane. Gooseberry—Trim to one stalk, and encourage to form wide-spreading heads. Raspberry—Head back the canes to 2½ feet, and laterals to 15 inches from the cane.

List of varieties established as reliably productive, named in the order of value: Blackberry, Kittatinny and Lawton; gooseberry, Houghton and Pale Red; raspberry, Doolittle and Turner.

The one variety giving satisfactory results, in plant and product: Blackberry, Kittatinny; gooseberry, Houghton; raspberry, Doolittle.

Mulching has been an advantage both in summer and winter.

Manuring is profitable to all classes of small fruits growing on thin soil; should be applied late in the fall or early spring, on the surface, and well worked in, at the rate of fifteen wagon-loads to the acre.

VINEYARDS.

Date of first planting, 1867, by Sidney Smith, Topeka.

Location most desirable: East slope, with protection on the west and north, open on the south and east.

Soil most productive: Most any kind having good under-drainage.

Preparation of soil: Deep plowing, as for a corn crop, in the fall.

Preferred manner of planting: In rows running north and south, 8 feet apart, plants 12 feet apart in the rows. Two-year-old plants are the most suitable.

Cultivation: Shallow during the growing season.

Training and pruning: Use the wire trellis, and prune to fan-shape system.

Preferred list of varieties, in the order of their success: For family use, Concord, Dracut Amber, Delaware, Clinton; for market, Concord.

MISCELLANEOUS NOTES.

The extent of planting in 1880: Apple cherry and blackberry, twenty per cent. increase of that of 1879; other classes the same as in 1879.

The present condition of horticultural investments is generally satisfactory, and warrant an extended investment in the future. There is a general interest and confidence in the pursuit among the people.

WABAUNSEE COUNTY.

BY ABNER ALLEN, WABAUNSEE.

ORCHARDS.

Date of first planting: Apple, peach and plum in 1858, pear in 1856, cherry in 1861, by I. Smith, H. Bisby, I. M. Bisby and C. B. Lines, of Wabaunsee.

Date of first fruiting: Apple, peach and plum in 1865, pear in 1866, cherry in 1861, on the farms of I. Smith, I. M. Bisby and C. B. Lines, of Wabaunsee.

Location most desirable: Apple and pear — On high northern and northwest slopes in some cases. The Rawles Genet apple is productive in all situations. Peach and plum — On locations where shade of a bluff on the south retards early blooming; some of the hardy sorts succeed in most all situations. Cherry — It is immaterial.

Soil most productive: Apple and pear, a limestone or red-clay subsoil; with the peach, plum and cherry, very little difference is manifest.

Preparation necessary: The ordinary method of plowing and harrowing.

Planting season: As early in spring as possible.

Method and distances: Shallow planting, using water to settle the dirt among the roots. Do not lean the trees. Set apples not less than 30 feet each way, pear 20 feet, peach 15 feet, plum and cherry 12 feet.

Cultivation, for all classes except the plum, should be thorough, with a two-horse cultivator and double-shovel plow, in May, June and July, keeping weeds down with a hoe. Grow no crops among them after the fifth year. Plum should receive thorough and continued culture until the fruit ripens.

Pruning season and system: Apple—Any time from November to the following July. Form the head two feet from the ground. Shorten in side branches, and thin out annually. All tendency to fork should be checked. Do not prune heavily at any time. Pear — In same season as for apples. Do but little of it other than to check the strong upright-growing limbs, and to form a symmetrical head about two feet from the ground. Plum and cherry—Prune only to give proper shape, and thin dense-growing sections of the tree.

Wind-breaks, on the west, north and south sides of an orchard or garden, are an advantage. Construct in rows 8 to 10 feet apart, 1½ to 2 feet in the row. Cultivate till they shade the ground. Red cedar, cottonwood, box elder and elms have been successfully used.

List of varieties, named in the order of their value and productiveness—*For family purposes:* Apple—Rawles Genet, Winesap, Jonathan, Rome Beauty, Willow Twig, Gilpin, Grimes's Golden, Swaar, Summer Rose, Wagener, Maiden's Blush, Gramar's Pearmain. Pear and peach—Those found in the "Voted Fruit List" of the Society, p. 448, vol. IX. Plum—Wild Goose, Miner, and selected native varieties. Cherry—Early Richmond, common Morello, and Kentish. *For market purposes:* Apple—Ben Davis, Winesap, Missouri Pippin, Rawles Genet, Rome Beauty, Willow Twig, Gilpin. Pear—Bartlett, Duchesse d'Angouleme, Vicar of Winkfield, Seckel, Buffum, Beurre d'Anjou, Sheldon. Peach—Crawford's Early, Hale's Early, Crawford's Late, Heath Cling, Large Early York, Stump the World, Amsden's June, Old Mixon Free. Plum—Wild Goose, Miner, Chickasaw, Damson, Lombard, Sand. Cherry—Early Richmond, common Morello, May Duke, Gov. Wood, Belle Magnifique.

List of preferred varieties, and proportions of each to plant in a family orchard of 100 trees: Apple—Summer, 2 Summer Rose, 2 Early Harvest, 2 Carolina Red June, 2 Early Pennock, 2 Duchess of Oldenburgh; autumn, 2 Maiden's Blush, 2 Wagener, 2 Rambo, 2 Fameuse; winter, 25 Rawles Genet, 15 Winesap, 10 Ben Davis, 7 Grimes's Golden, 5 Willow Twig, 5 Gilpin, 5 Lansingburgh, 5 Swaar, 5 Lawver.

For a market orchard of 1,000 trees: Apple, 200 Ben Davis, 100 Winesap, 100 Missouri Pippin, 300 Rawles Genet, 100 Willow Twig, 100 Rome Beauty, 100 Lawver.

SMALL FRUITS.

Date of first planting: Blackberry and strawberry in 1861, currant in 1858, gooseberry and raspberry in 1862, by A. Allen, I. Smith and Hiram Keyes, of Wabaunsee.

Location preferable: Blackberry, northern slope, or one protected on the south with timber-belt; currant, in a shade; gooseberry, and strawberry, immaterial; raspberry, elevated lands.

Soil most productive: Blackberry, poor clay land; currant and gooseberry, rich land; raspberry, strong clay loam; strawberry, no difference.

Preparation: Well plowed and harrowed.

Planting season: In spring, for all classes.

Cultivation: For blackberry, should be shallow, only sufficient to keep the weeds subdued; for currant, gooseberry, raspberry and strawberry, cultivate thoroughly through the growing season.

Pruning: Blackberry—Pinch off the ends of growing canes when they shall

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have reached 2½ feet in height, and remove old canes soon after fruit has ripened. Currants—Thin out the stools when too dense, in spring. Gooseberry—Annually cut out one-third of the old bearing wood, in the spring. Raspberry—Shorten the canes in summer to cause them to grow stocky, and remove old canes as soon as fruit has been picked.

List of varieties reliably productive, named in the order of their value: Blackberry, Kittatinny and natives; currant, Red Dutch; gooseberry, Pale Red, Houghton, Downing and Mountain; raspberry, Miller's Daily, Ganargua, McCormick (syn. Mammoth Cluster); strawberry, Wilson's Albany and Downer's Prolific.

The Kittatinny blackberry, Red Dutch currant, Pale Red gooseberry, Miller's Daily raspberry and Wilson's Albany strawberry afford the most satisfactory results in plant and fruit.

Manuring has been profitable with the raspberry, currant and gooseberry; should be applied as a surface-dressing in the spring and summer, and well worked into the land.

VINEYARDS.

Date of first planting: 1860, by C. Hangaman, at Alma.

Location most desirable: Succeed in most any kind; cannot see any difference in results of any well-drained soil.

The preparation should be such as is required for the production of a crop of corn or potatoes.

Planting—distance: In rows 10 feet apart, and 8 feet in the row.

Training and pruning: Spur and renewal systems combined. Two-year-old plants are preferable.

Cultivation: Should be thorough, and continued through the season.

List of preferred varieties, in the order of success: For family use, Martha, Concord, Delaware, Dracut, Hartford Prolific; for market, Concord, Hartford Prolific, and Dracut Amber.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that in 1879, was about the same, with the exception of blackberry and strawberry, which was greater.

The present condition of horticultural investments in this county is encouraging, and the results of the past years fully warrant extended efforts in the industry in the future. The interest and confidence of the people in the pursuit is general.

BY H. A. STILES, PAVILION.

ORCHARDS.

Date of my own planting in this county: Apple, pear and cherry in 1866, peach in 1867, plum in 1868.

Date of first fruiting: Apple and cherry in 1868, pear in 1869, peach in 1870.

Experiences of the past years have led to the conclusion that the most desirable location for apple and pear orchards is dry upland slopes, with deep depressions on the south and southeast, and a shelter on the south; peach and plum, as for apple, but with a northern slope, and more elevated; cherry, well-drained slopes.

Soil most productive: Apple, any good soil; sandy or heavy clay either are productive. Pear, well-drained loam. Peach, well-drained loamy clay. Plum, any well-drained upland; cherry, well-drained loam.

Preparation of land before planted: Deep fall plowing for all classes.

Planting season preferable: Early in spring.

Method and distances: Lay off the land in rows with plow, for apple, 28 to 30 feet apart each way; set the trees at the checks or points where the rows cross each other, about 2 inches deeper than they stood in the nursery, pack earth firmly about the roots, and fill up, leaving the surface mellow. Alternate with peach in an apple orchard, so that they will stand opposite to the apple. For peach and pear alone, plant the same as apple, but one rod apart each way; plum and cherry, 16 feet apart each way.

Cultivation: Apple, should be thorough during the growing season; pear, until September; peach, plum and cherry, until August.

Mulching is a good substitute for cultivation.

Pruning: Apple—All pruning should be done while the growth is young; shoots and unnecessary limbs should be removed whenever they start in places on the tree where they are not needed. Pear—Head back all long shoots, and remove such limbs as will chafe in the future. Peach—Cut back the growth each year in the spring, remove all decaying branches, and thin out where found too dense. Plum—Trim moderately in spring. Cherry—Remove dead and useless limbs.

Wind-breaks are useful to orchards, planted on the south side, and to gardens when on the south and north. Construct in rows 6 feet apart, and set trees in the rows 4 to 6 feet apart. For convenience in planting and culture, two rows are sufficient, and should be set with the trees in one row, alternating those in the other. For such purposes the peach tree has been used extensively, for the fruit it produces, and its excellent fuel, when thinned out. Box elder, cottonwood and elm are valuable. Cultivation: If peach is used, it should receive good cultivation and pruning each year, to increase the quality of its fruit; other classes will only require cultivation.

List of varieties of fruit which have been productive, named in the order of value—*For family purposes:* Apple—Cooper's Early White, Red Astrachan, American Summer Pearmain, Jonathan, Grimes's Golden, Sops of Wine, Winesap, Rawles Genet, Seek-no-further, Jersey Sweet, White Winter Pearmain, McAfee's Nonsuch. Pear—Bartlett, Duchess d'Angouleme, Howell, Vicar of Winkfield, and Lawrence. Peach—Crawford's Early, Crawford's Late, Hale's Early, Alexander, Early York, Heath Cling, Yellow Rare-ripe, Red Rare-ripe (syn. Early Rare-ripe), and Stump the World. Plum—Wild Goose, Miner, and Chickasaw. Cherry—Early Richmond, and common

Morello. *For market purposes:* Apple—Winesap, Rawles Genet, Ben Davis, Missouri Pippin, Grimes's Golden, White Winter Pearmain, Westfield Seek-no-further, Jonathan, Talman's Sweet. Pear—Bartlett, and Duchesse d'Angouleme. Peach—Alexander, Hale's Early, Crawford's Early, Crawford's Late, Stump the World, Heath Cling, Yellow Rare-ripe, and Indian. Cherry—Early Richmond.

List of varieties preferred, and proportions of each, to plant in an orchard of 100 trees, for family use: Apples—Summer, 5 Early Harvest, 3 Summer Rose, 2 Red Astrachan, 2 Jersey Sweet, 3 Carolina Red June; autumn, 4 Maiden's Blush, 3 Rambo, 4 Cooper's Early White, 4 Lowell; winter, 20 Winesap, 20 Ben Davis, 10 Rawles Genet, 7 Grimes's Golden, 6 Jonathan, 7 White Winter Pearmain.

Varieties most reliable, named in the order of profit, and numbers of each to plant in an orchard of 1,000 trees, for market purposes: 300 Winesap, 200 Rawles Genet, 200 Ben Davis, 100 Missouri Pippin, 100 White Winter Pearmain, 100 Rome Beauty.

SMALL FRUITS.

Date of my own planting: All classes in 1866.

Location preferable: Blackberry and raspberry, a northern aspect, with a wind-break on the south and partially shaded; currant, north side of a stone wall or board fence. Gooseberry, northern aspect; strawberry, sheltered on the south.

Soil most productive: Blackberry, a rich clay loam; all others succeed on a clay loam.

Land for small fruits should be deeply prepared by plowing, pulverizing, and enriching where not so naturally.

Planting—preferred season: All classes in the spring.

System: Mark out the rows with a plow, for blackberry, 8 feet apart, set in the row 4 feet apart; gooseberry, 6 feet apart, in the row 3 to 4 feet apart; raspberry, same as for gooseberry; strawberry, plant in long rows 4 feet apart, and 12 inches in the rows.

Cultivation: Blackberry—Mulch and remove all suckers, or cultivate during early part of the season, never later than August. Currants—A thorough mulch at all times. Gooseberry and raspberry require the same treatment as that given the blackberry. Strawberry—Form into matted rows. Keep the ground enriched with plenty of well-rotted manure.

Pruning: Blackberry and raspberry, pinch off the ends of the young canes as soon as they have reached 2½ or 3 feet in height, and the laterals at one foot; currant, thin out the stools in early spring; gooseberry bushes should be thinned out each spring, old stools taken up, divided and reset.

List of varieties reliably productive, and named in the order of their value: Blackberry, Kittatinny, Lawton, and Missouri Mammoth; currant, Red Dutch, White Grape, and Black Naples; gooseberry, Houghton, and Smith's

Improved; raspberry, McCormick and Doolittle; strawberry, Wilson's Albany and Green Prolific.

The one variety affording the most satisfactory results in plant and fruit: Kittatinny blackberry, Red Dutch currant, Houghton gooseberry, McCormick raspberry, and Wilson's Albany strawberry.

Mulching has been an advantage to small fruits, both in winter and summer.

Manuring small fruits is profitable, when the land is not already rich. Should be applied in the fall or winter, and worked into the soil in spring. Eighty two-horse wagon-loads is not too much for an acre of ground.

VINEYARDS.

Date of my own planting: In 1866.

Cannot discover any material difference in the results of locations.

Soil most productive: A dry, clay loam; should be thoroughly prepared by deep plowing and pulverizing.

Select strong, one or two-year-old vines; plant in rows 9 feet apart, and 7 feet in the row.

Prune and train to the renewal system.

List of preferred varieties, given in the order of success: For family use, Delaware, Catawba, Ives, Martha, and Concord; for market, Catawba, Concord, Hartford Prolific, and Dracut Amber.

MISCELLANEOUS NOTES.

The extent of planting in 1880, compared with that of 1879: Apple, pear, cherry, blackberry and raspberry, an increase; peach, currant, gooseberry and strawberry, about the same.

The present condition of horticultural investments in the county is good, and where properly taken care of, very good, and are sufficiently satisfactory to warrant an extension in the future. There is a general interest and confidence in the pursuit among the people.

WASHINGTON COUNTY.

BY DR. CHAS. WILLIAMSON, WASHINGTON.

ORCHARDS.

Date of first planting: Apple in 1861, pear in 1870, peach in 1871, plum in 1870, cherry in 1871, by Wm. E. B. Cook and W. E. Woolbertson, Washington.

Date of first fruiting: Apple in 1867, pear in 1872, peach in 1873, plum and cherry in 1875.

Location most desirable: Apple, northern slope, protected with timber;

pear, high prairie; peach, high land, well protected with timber; plum, lowlands; cherry, immaterial.

Soil most productive: Apple, clay loam; pear, rather poor, gravelly land; plum, rich; cherry, most any kind.

Preparation: For apple, peach, plum and cherry, deep tillage before planting, and plenty of mulch and manure thereafter; pear, deep.

Planting season: Spring, for all classes.

Distances: Apple, 32 feet each way, alternate with peach; pear and peach, 16½ feet; plum, 10 to 12 feet; cherry, 20 feet each way.

Cultivation: Apple and peach, early spring, to July 1st.

Pruning: Apple and pear, in May and July.

Wind-breaks: Should be constructed on all sides, in rows, especially on the southwest. Box elder has been successful for such purposes. Tops should be cut back to make low heads.

The present voted fruit list of the Society contains every variety needed for a family or market orchard.

SMALL FRUITS.

Date of first planting: All classes except strawberry in 1861, the latter in 1870, by Jacob Pennwell, Washington.

Location preferable: Blackberry, raspberry and strawberry, bottom land, not too low; currant, in shade; gooseberry, upland.

Soil most productive: Bottom land.

Preparation: Deep plowing before planting.

Planting season: Blackberry in autumn, all other classes in spring.

System: Blackberry, in rows 8 feet apart, and 6 feet in the row.

Cultivation: With cultivator the first year, and mulch thereafter.

Pruning: Blackberry and raspberry, cut off the tips of the canes when they reach 3 feet in height, and the laterals at 1 foot; currant, remove one-third of the growth, after August 1st.

List of reliably productive varieties in the order of value: Blackberry, Kittatinny, Snyder; currant, Red Dutch; gooseberry, Houghton; raspberry, Doolittle and McCormick; strawberry, none are very reliable.

The one variety that affords the most satisfactory results in plant and product: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Houghton; raspberry, Doolittle; strawberry, Wilson's Albany.

Mulching has been an advantage in summer and winter.

Manuring is profitable to all classes; it should be applied in spring, and worked into the land with a cultivator, at the rate of twenty wagon-loads to an acre.

VINEYARDS.

Date of first planting: In 1870, by Geo. Pennwell, of Washington.

Location most desirable: Northern slope.

Soil most productive: That near water-courses.

Preparation: Deep plowing.

Distances to plant: In rows 8 feet apart, and 6 feet in the row. One-year-old plants are the most suitable to use.

Cultivation: Should be done in early spring.

Training: On trellis.

A list for family use: Concord—same for market.

MISCELLANEOUS NOTES.

The extent of planting in 1880 was one-third more than in 1879.

The present condition of horticulture is very good, and warrants extended investments in the future. There is a general interest and confidence in the pursuit in this county.

WILSON COUNTY.

BY G. B. BROWN, GUILFORD.

ORCHARDS.

The most desirable location for apple: For early fruitfulness, on upland; but with age of the trees, bottom lands are equally productive. Hillsides, below sandstone strata, have produced good crops of the pear; peach, but little difference; plum succeeds on both upland and lowland, if protected from insects; cherry, location is not material.

Land for orchards should be deeply plowed before planted.

Plant apple and pear in the fall, peach and cherry in the spring; plum, either in spring or autumn, in rows 30 feet each way; cultivate the same as is required to produce a crop of corn. Late culture should be avoided.

Prune in February and March; form the head with a center stem, upon which arrange the limbs regularly, and at such distances as will relieve any necessity of cutting out large limbs in after years. Upright growers may be allowed to branch quite low, but spreading varieties should have the head formed sufficiently high to prevent the branches resting on the ground when loaded with fruit. Forming of the tree should be done while they are young, and before they commence fruiting; afterwards only remove such limbs as are chafing. Water sprouts, bend down and tuck under the larger limbs, to avoid an increased number growing, as would be the case if cut off.

Wind-breaks have proven an advantage to orchards and gardens, when located on the south side.

Varieties of fruit that have been productive in this county, named in the order of their value: Apple, Early Harvest, Carolina Red June, Cooper's Early White, Maiden's Blush, Jonathan, Missouri Pippin, Ben Davis, Gilpin, Limber Twig, Rawles Genet; Peach, Alexander, Hale's Early.

SMALL FRUITS.

Kittatinny blackberry, Houghton gooseberry and McCormick raspberry have been successful in this locality.

Mulching has been an advantage to small fruits, both in summer and winter.

Manuring has been profitable with all classes, excepting where the land is naturally rich.

VINEYARDS.

Grapes succeed on all soils and locations, when properly cultivated.

The land for vineyards should be well prepared by deep plowing before planting. One or two-year-old vines are most suitable. Set deep in rows 8 feet apart each way. Cultivate them sufficiently during the summer to keep down all weeds.

Preferred varieties are the Concord, Ives, and Delaware.

The results of past years are sufficiently satisfactory to warrant extended investments in the future. The interest of the people in the pursuit of fruit growing is becoming general.

WOODSON COUNTY.

BY W. W. SMITH, NEOSHO FALLS.

ORCHARDS.

Date of first planting: In 1858, by the earliest settlers.

Location preferable: Those that are protected from winds and are well drained, for all classes. A poultry yard is an excellent place for plums.

Soil most productive: Apple—A rich sandy bottom loam produces fine fruit of some varieties; and a poor soil, moderately manured, is equally as successful. Peach—Light sandy upland produces a thrifty, well-ripened wood growth, and a highly-flavored fruit. Plum and cherry—Can see no difference in locations.

Soil—preparation: Apple, pear, plum and cherry, thorough and deep pulverizing, and a liberal application of manure to lands of a poor character; peach, thorough—deep plowing and pulverizing.

Season for planting: In spring, for all classes.

System and distance for planting: Apple, on ordinarily fertile land set 25 feet apart each way, on such as river and creek bottoms 30 feet; pear, 20 feet; peach, plum and cherry, 16 feet each.

Cultivation: Apple—Grow crops of corn and potatoes until the trees shade the land, then seed to grass, or leave it unseeded and mow the weeds, and allow them to rot on the land. Pear—Same as for the apple. Peach—Must be annually cultivated during the fore part of summer, to obtain the best results. Potatoes and corn may be grown among them while young. Plum and cherry—Cultivate three or four years, or until they commence fruiting, then quit, and allow the ground to become hard, to prevent the larvæ, or worm of the curculio, burrowing in it as it passes from the fallen fruit, and thus affords poultry and other natural enemies a better chance to destroy it.

Pruning-time, and system: During winter or early spring trees suffer less from the wounds than at any other time; besides, the absence of leaves affords a better opportunity to readily discover what the work should be. Low heads are much preferred, as the trunk is better protected by the branches. Prune only to balance and open up the top. Pear — Trees having low heads are the most successful, and escape sun-scald. Peach — When trees become old and form the leaves and fruit buds at the extremities of long limbs, cut them back in spring-time; this will cause young shoots to push out, which mature plenty of fruit buds for next year. Plum and cherry — In spring; allow the head to form within two feet of the ground, and prune only as is needed to properly balance and open the top.

Wind-breaks, constructed on the south and southwest sides of an orchard or garden, have been an advantage. The cottonwood and soft maple are successful for such purpose, set in rows 6 feet apart, and 4 feet in the rows; cultivate as for corn until they shade the ground.

List of varieties, in their order of value and productiveness — *For family purposes:* Apple — Winesap, Missouri Pippin, Early Harvest, Rawles Genet, Rambo, Carolina Red June, Yellow Bellflower, Ben Davis, Red Winter Pearmain, Milam, Lowell, Vandevere, Keswick Codlin. Pear — Bartlett, Duchess d'Angouleme, Flemish Beauty. Peach — Harper's Early, Amsden's June, Crawford's Early, Crawford's Late, Smock, LaGrange, Hale's Early, Indian Blood Cling, Old Mixon Free, Troth's Early Red. Plum — Wild Goose, Damson, Miner, and native varieties. Cherry — Early Richmond, common Morello. *For market purposes:* Apple — Winesap, Rawles Genet, Missouri Pippin, Ben Davis, Red Astrachan, Limber Twig, Early Harvest, Carolina Red June. Peach — Harper's Early, Smock, Crawford's Early, Crawford's Late, LaGrange. Plum — Wild Goose, Miner. Cherry — Early Richmond, common Morello.

List of varieties, proportion of each, for a family orchard of 100 trees: Apple — Summer, 3 Early Harvest, 3 Carolina Red June, 3 Red Astrachan, 3 Keswick Codlin; autumn, 5 Maiden's Blush, 5 Rambo, 5 Buckingham (syn. Fall Queen), 5 Red Winter Pearmain, 5 Chenango Strawberry; winter, 10 Winesap, 10 Missouri Pippin, 10 Limber Twig, 10 Rawles Genet, 5 Milam, 5 Roman Stem, 5 Yellow Bellflower, 5 Gilpin, 5 Vandevere.

List of varieties, proportion of each, reliably productive and in the order of profit, for a market orchard of 1,000 trees: Apple, 250 Winesap, 150 Missouri Pippin, 150 Ben Davis, 150 Rawles Genet, 150 Limber Twig, 25 Lowell, 25 Rambo, 70 Jonathan, 15 Early Harvest, 15 Red Astrachan.

SMALL FRUITS.

Date of first planting: About 1858; address of parties, unknown.

Location preferable: Blackberry, gooseberry and raspberry, immaterial; currant, shaded.

Soil most productive: Blackberry and currant, moist; raspberry and strawberry, sandy loam.

Soil preparation: Thorough and deep plowing, and on poor land; a liberal manuring for all classes; for the strawberry, the ground should be well manured.

Season for planting: Spring, for all classes except the strawberry, which should be set in summer, as soon as suitable young plants are formed.

System for planting: Blackberry, in rows 8 feet apart, and 3 feet in the row; gooseberry, 6 feet apart, and 3 feet in the row; raspberry, 6 feet apart, and 4 feet in the row; strawberry, 3 feet apart, and 14 inches in the row.

Cultivation: Blackberry, thorough, between the rows, during the growing season; currant, a heavy mulch; gooseberry and raspberry, thorough, between the rows, in early spring; strawberry, thorough, between the rows, and hoeing of the rows.

Pruning: Blackberry—When the new cane has grown two or three feet, nip off the end; this will cause limbs to form. Currant and gooseberry—Remove old wood where the growth has become thick. Raspberry—Cut off the ends of growing canes, as with the blackberry.

List of varieties reliably productive, and in the order of value: Blackberry, Kittatinny and Lawton; currant, Red Dutch the best; gooseberry, Houghton, Pale Red, Mountain; raspberry, McCormick, native sorts, Doolittle; strawberry, Wilson's Albany, Crescent, Downer's Prolific, Kentucky.

The one variety affording most satisfactory results, in plant and product: Blackberry, Kittatinny; currant, Red Dutch; gooseberry, Houghton; raspberry, McCormick (syn. Mammoth Cluster), strawberry, Wilson's Albany.

Mulching has been an advantage both summer and winter.

Manure should be applied in the preparation of the ground, and as a mulch in early winter.

VINEYARDS.

Date of first planting, in 1859.

Location most desirable: Bottom land, protected with forest trees.

Soil most productive: Any rich and well drained.

Preparation: Thorough and deep plowing.

System for planting: In rows 8 feet apart, and 6 to 8 feet in the row. One-year-old plants are preferable.

Cultivation: Plow in early spring, and two or three times during the fore part of summer.

Training and pruning: Train to trellis; shorten and thin out the vines in early spring.

List of varieties, in the order of success: For family use, Concord, Dracut Amber, and Delaware; for market, Concord and Dracut Amber.

MISCELLANEOUS NOTES.

The extent of planting in 1880 compared with that of 1879, of all varieties, equal.

The present condition of horticultural investments is so encouraging, and the interest in the pursuit general, as to warrant extended work in the future.

COUNTY STATISTICS.

TABLE showing the number of fruit trees in bearing, 1880.

Counties.	*Apple.*	*Pear.*	*Peach.*	*Plum.*	*Cherry.*
Allen	47,172	10,599	65,577	8,338	19,292
Anderson §	58,217	1,789	68,240	8,061	15,144
Atchison	70,263	1,882	63,256	1,245	19,155
Barbour §	....	....	....	....	....
Barton	808	583	8,295	278	138
Bourbon §	123,952	2,962	101,388	2,047	27,192
Brown	51,840	914	123,942	1,866	12,449
Butler	23,531	622	271,857	7,229	10,860
Chautauqua	24,506	316	145,118	2,795	5,079
Chase	7,793	5,707	24,470	361	4,488
Cherokee	112,878	4,329	116,980	2,918	28,068
Clay §	8,235	77	82,809	6,353	2,071
Cloud	2,647	118	73,704	2,708	2,434
Coffey §	45,171	907	74,402	5,180	16,001
Cowley §	22,872	704	248,095	6,262	6,706
Crawford	76,014	1,662	72,671	2,029	17,650
Davis	5,552	1,132	83,280	1,418	2,884
Decatur §	....	....	400	....	....
Dickinson	12,758	825	167,558	10,241	5,918
Doniphan	74,154	960	51,646	1,426	10,862
Douglas	140,557	7,283	61,040	3,204	28,879
Edwards §	....	....	1	1	12
Elk	23,215	346	184,898	2,690	5,477
Ellis	182	1	100	20	44
Ellsworth	97	471	8,626	221	117
Ford	....	....	....	....	....
Franklin	90,851	1,425	58,882	1,469	20,666
Greenwood §	22,890	782	108,785	1,098	8,329
Harper §	1	....	104	....	25
Harvey	8,186	3,991	98,838	8,678	4,286
Jackson	58,591	961	69,158	630	11,069
Jefferson	72,681	1,485	67,163	1,084	21,670
Jewell §	1,110	666	80,771	7,063	2,871
Johnson	92,336	2,220	59,977	2,339	26,093
Kingman	....	....	....	....	....
Labette	123,482	3,954	150,262	4,151	19,229
Leavenworth	136,047	4,236	60,634	1,874	20,557
Lincoln	182	34	7,954	12,573	80
Linn §	99,421	1,614	86,206	3,918	28,763
Lyon	68,549	1,538	102,586	1,943	17,309
Marion §	6,250	732	68,439	2,991	3,374
Marshall	21,473	443	78,684	2,196	6,818
McPherson	3,909	97	77,012	7,907	2,528
Miami	112,754	1,818	59,248	2,244	32,615
Mitchell	984	63	53,591	7,021	870
Montgomery	77,310	1,345	191,232	5,079	28,040
Morris	14,001	300	61,626	1,630	3,175
Nemaha	19,663	656	69,814	542	6,911
Neosho	62,843	1,580	153,047	8,921	15,548
Norton §	530	2	1,618	14	55
Osage	48,877	874	91,669	2,127	16,074
Osborne	557	788	5,750	97	359
Ottawa	2,141	6,809	82,486	698	5,809
Pawnee	....	....	1,598	308	103
Phillips §	130	....	1,376	299	92
Pottawatomie	20,899	756	75,330	1,347	8,528
Pratt §	....	....	....	....	....
Reno	3,103	177	65,005	6,319	1,776
Republic §	4,351	862	72,408	6,782	2,743
Rice	559	2	19,506	4,462	703
Riley	10,452	1,195	42,198	855	2,414
Rooks	116	....	364	....	50
Rush	25	....	1,625	....	10
Russell	76	55	2,065	252	102
Saline	4,618	1,182	48,004	9,346	1,506
Sedgwick	18,200	1,157	221,364	8,407	8,034
Shawnee	65,398	2,824	66,171	2,114	24,427
Smith §	318	138	11,638	1,973	200
Stafford §	86	....	229	....	2
Sumner	11,824	330	174,484	3,439	3,623
Wabaunsee	18,741	698	48,596	1,218	5,171
Washington	6,772	151	74,618	655	2,461
Wilson	50,266	1,041	161,958	4,368	18,929
Woodson	22,958	489	71,246	954	8,079
Wyandotte	73,906	2,239	16,488	1,867	9,036
Total	2,386,812	94,653	5,091,549	204.106	687,188

§ Quarterly Report of State Board of Agriculture, June 30, 1880.

COUNTY STATISTICS—CONTINUED.

TABLE showing the acreage of small fruits and vineyards, 1880, by counties.

Counties.	*Rasp-berries.*	*Black-berries.*	*Straw-berries.*	*Acres of vineyards.*
Allen	44.78	50.58	27.17	40.92
Anderson §	67.25	22.00	10.00	22.25
Atchison	59.00	75.00	53.00	186.00
Barbour §	......	......	......	......
Barton	8.00	......	......	......
Bourbon §	83.80	67.26	7.64	75.97
Brown §	80.78	38.90	6.50	61.87
Butler	63.79	68.76	7.83	101.15
Chautauqua	7.55	86.12	6.50	34.74
Chase	.87	2.50	2.58	8.35
Cherokee	48.00	187.75	55.75	78.75
Clay §	22.00	36.25	20.75	3.00
Cloud	21.25	19.75	20.00	20.25
Coffey §	57.20	42.20	9.75	68.30
Cowley	114.48	108.87	21.18	44.10
Crawford	101.67	72.31	10.10	44.84
Davis	14.20	12.55	2.65	20.90
Decatur §	2.10	.12	......	......
Dickinson	68.50	66.75	16.00	126.00
Doniphan	48.00	23.00	9.50	253.00
Douglas	60.12	94.50	24.60	220.25
Edwards §	.75	......	......	......
Elk	28.67	68.25	9.15	52.76
Ellis	85.50	73.25	......	1.75
Ellsworth	10.25	8.50	4.10	3.10
Ford	.25	.25	......	......
Franklin	45.51	43.87	5.50	85.00
Greenwood §	9.02	25.23	11.65	84.40
Harper §	1.50	6.25	4.25	4.50
Harvey	22.00	88.00	8.00	26.00
Jackson	5.71	7.46	4.01	22.74
Jefferson	17.28	18.85	8.51	34.81
Jewell §	24.50	7.60	6.85	9.60
Johnson	47.01	89.02	9.38	134.51
Kingman	1.50	1.50	.75	.75
Labette	87.00	108.83	17.52	59.25
Leavenworth	204.01	79.34	36.62	192.38
Lincoln	6.50	.25	5.00	1.25
Linn §	23.25	49.00	5.95	44.90
Lyon	21.05	59.85	18.50	58.25
Marion §	10.00	12.25	6.75	7.00
Marshall	62.60	18.41	28.90	15.29
McPherson	29.05	84.60	14.31	80.89
Miami	18.05	57.91	6.82	78.48
Mitchell	30.28	9.74	7.12	29.76
Montgomery	48.55	104.21	32.12	189.02
Morris	6.66	15.50	5.00	14.75
Nemaha	24.72	19.65	9.86	33.10
Neosho	26.55	59.58	16.27	62.88
Norton §	18.00	5.00	.82	6.25
Osage	31.92	64.33	6.74	60.11
Osborne	5.25	4.50	4.75	2.00
Ottawa	30.12	12.80	1.00	18.40
Pawnee	.39	.20	.25	1.25
Phillips §	8.50	1.55	1.75	3.00
Pottawatomie	18.76	20.57	4.54	47.58
Pratt §	......	......	......	......
Reno	19.75	15.75	4.00	15.75
Republic §	81.96	17.06	10.18	7.26
Rice	3.75	4.11	1.48	2.00
Riley	5.90	1.00	6.87	10.50
Rooks	2.96	4.04	6.50	11.25
Rush	......	......	......	......
Russell	2.72	.38	.12	1.12
Saline	25.80	22.40	6.75	86.20
Sedgwick	24.25	80.75	6.25	56.50
Shawnee	88.80	74.40	10.40	105.75
Smith §	76.08	1.87	......	2.12
Stafford §	.30	.06	......	1.42
Sumner	28.88	57.79	16.36	88.80
Wabaunsee	12.25	12.35	1.40	23.80
Washington	21.42	12.84	10.18	1,912.06
Wilson	123.20	75.71	25.70	86.90
Woodson	20.00	18.00	7.00	9.00
Wyandotte	908.85	97.85	165.57	529.58
Total	3,219.17	2,590.06	886.90	5,529.06

§ Quarterly Report of State Board of Agriculture, June 30, 1880.

COUNTY STATISTICS—CONCLUDED.

TABLE showing the number of fruit trees not in bearing, 1880.

Counties.	*Apple.*	*Pear.*	*Peach.*	*Plum.*	*Cherry.*
Allen	52,289	7,240	30,142	1,774	16,172
Anderson §	49,442	1,722	26,743	2,170	7,352
Atchison	80,814	2,406	26,451	1,677	7,283
Barbour §	1,234	70	8,031	66	749
Barton	25,019	1,544	64,389	4,906	3,402
Bourbon §	88,491	4,113	25,457	2,265	12,173
Brown §	134,379	2,255	68,724	3,259	11,121
Butler	97,281	3,760	189,110	6,567	26,520
Chautauqua	53,186	2,652	51,109	4,147	10,946
Chase	23,818	1,181	18,074	667	3,397
Cherokee	113,446	4,976	35,191	4,908	17,854
Clay §	36,414	1,288	101,778	5,983	10,780
Cloud	47,008	1,357	123,982	4,466	10,150
Coffey §	74,425	4,733	89,884	4,214	11,701
Cowley	92,466	4,222	180,093	4,244	16,906
Crawford	103,132	5,457	81,110	3,318	18,023
Davis	21,611	1,565	47,394	3,084	7,159
Decatur §	610	83	5,406	126	371
Dickinson	61,621	2,845	178,777	13,366	23,354
Doniphan	88,218	1,818	86,163	2,453	7,629
Douglas	75,576	3,033	17,899	1,079	7,603
Edwards §	2,597	79	7,064	329	173
Elk	56,611	2,683	35,807	3,566	10,408
Ellis	6,513	858	14,520	795	990
Ellsworth	19,217	1,663	42,534	2,049	2,668
Ford	2,917	379	1,572	356	389
Franklin	60,724	2,124	26,888	2,183	10,710
Greenwood §	63,013	3,546	58,618	1,983	11,355
Harper §	10,933	353	67,703	1,232	3,252
Harvey	62,204	3,187	86,839	7,209	15,829
Hodgeman	932	24	1,308	80	164
Jackson	72,323	1,452	24,505	1,439	6,698
Jefferson	69,568	1,519	28,596	1,819	9,673
Jewell §	68,428	2,897	173,506	10,365	11,274
Johnson	57,062	2,542	24,629	1,716	8,566
Kingman	7,416	86	53,414	2,453	2,406
Labette	117,819	8,318	49,272	5,310	18,078
Leavenworth	117,228	2,149	25,852	1,230	7,717
Lincoln	18,486	1,071	55,014	2,383	2,276
Linn §	77,182	2,636	42,117	1,949	9,224
Lyon	98,935	3,793	75,513	2,251	13,247
Marion §	47,494	2,161	81,120	5,174	13,995
Marshall	74,621	2,235	58,109	2,810	12,641
McPherson	65,498	2,796	188,804	13,785	13,537
Miami	63,161	2,462	27,788	1,829	10,069
Mitchell	74,267	1,899	137,701	7,898	12,068
Montgomery	95,507	2,571	42,486	4,874	15,969
Morris	47,536	2,334	53,844	2,571	11,715
Nemaha	56,064	1,987	39,302	975	8,765
Neosho	102,934	4,478	47,597	4,107	16,903
Norton §	4,374	425	13,382	111	406
Osage	94,822	2,858	40,075	2,808	13,895
Osborne	23,844	1,674	56,110	2,091	2,721
Ottawa	22,878	3,928	90,134	3,925	6,173
Pawnee	6,808	427	27,606	1,658	1,448
Phillips §	14,682	691	29,376	1,304	3,071
Pottawatomie	63,425	1,649	52,054	2,114	12,030
Pratt §	197	560	7,664	30	27
Reno	81,965	2,188	152,800	10,635	7,971
Republic §	50,594	1,832	123,206	10,135	11,718
Rice	17,704	956	73,247	8,766	3,810
Riley	15,558	1,645	35,789	1,539	2,242
Rooks	18,646	1,508	38,007	4,906	3,226
Rush	4,135	256	38,809	2,382	335
Russell	16,547	595	27,677	1,986	2,549
Saline	39,349	2,760	89,859	13,532	7,433
Sedgwick	97,202	5,719	277,309	9,292	22,111
Shawnee	98,525	4,190	36,555	3,556	14,966
Smith §	37,266	1,076	81,404	4,830	3,504
Stafford §	6,651	352	39,216	467	1,901
Sumner	75,176	6,915	383,685	12,660	17,508
Wabaunsee	47,583	1,408	38,800	1,156	6,697
Washington	51,290	2,127	64,033	2,039	12,511
Wilson	82,705	2,944	40,479	6,179	16,500
Woodson	43,590	2,189	23,070	2,595	10,866
Wyandotte	76,741	1,808	25,124	2,709	7,522
Total	3,973,217	179,270	4,786,283	282,192	683,073

§ Quarterly Report State Board of Agriculture, June 30, 1880.

DIVISION, COUNTY AND LOCAL SOCIETIES.

NORTHWESTERN HORTICULTURAL SOCIETY.

(Organized May 10, 1874.)

The following are the officers for 1881:
President—H. C. Snyder, Glasco.
Vice President—R. W. Knox, Cawker City.
Secretary—E. A. Taylor, Beloit.
Treasurer—H. T. Walker, Beloit.
The meetings of this Society are held annually.

SOUTHEASTERN HORTICULTURAL SOCIETY.

(Organized November 4, 1874.)

The officers for 1881 are:
President—H. E. Van Deman, Geneva.
Vice President—D. B. Skeels, Galesburg.
Secretary—G. W. Ashby, Chanute.
Treasurer—C. C. Kelsey, Humboldt.
Meetings are held quarterly.

ANDERSON COUNTY HORTICULTURAL SOCIETY.

Officers for 1881:
President—D. W. Houston, Garnett.
Vice President—A. A. Adams, Garnett.
Secretary—M. A. Page, Garnett.
Treasurer—Samuel Buchanan, Garnett,
Meetings are held monthly.

BUTLER COUNTY HORTICULTURAL SOCIETY.

(Organized January 29, 1879.)

REPORTED BY THE SECRETARY.

Officers of the Society for 1881 are as follows:
President—J. R. Ward, Eldorado.
Vice President—S. F. C. Garrison, Eldorado.
Corresponding Secretary—L. Miller, Eldorado.
Treasurer—F. C. Buck, Augusta.

COWLEY COUNTY HORTICULTURAL SOCIETY.

(Organized February 1, 1879.)

REPORTED BY THE SECRETARY.

The following officers are elected for 1881:

President—James F. Martin, Winfield.

Vice President—W. H. Marsh, Arkansas City.

Secretary—P. B. Lee, Winfield.

Treasurer—G. W. Robertson, Winfield.

Librarian—C. J. Brane, Winfield.

County Vice President—J. Cairns, Winfield.

SUMMARY REPORT FOR 1880.

The Society adopted the following report on a fruit list:

Summer Apples—Early Harvest, Red Astrachan, Hightop Sweet, Cooper's Early White, Summer Queen.

Fall Apples—Maiden's Blush, Lowell, Fameuse, Wine.

Winter Apples—Winesap, Missouri Pippin, Ben Davis, Rawles Genet, Lawver, Jonathan, Rome Beauty, Smith's Cider, Gilpin, Dominie, Milam, White Winter Pearmain. For further trial the following are recommended, viz.: Kansas Keeper, Grimes's Golden, and Fink.

Pears—Flemish Beauty, Clapp's Favorite, Howell, Vicar of Winkfield, Duchesse d'Angouleme.

Peaches—Alexander, Hale's Early, Crawford's Early, Heath Cling, Amsden's June, Old Mixon Free, Ward's Late Free, Royal George, Steadly, and Stump the World.

Plums—Wild Goose, Washington, and natives.

Grapes—Concord, Ives, Delaware, Hartford Prolific.

Raspberries—Doolittle, McCormick, Clark, Brandywine, Turner.

Blackberries—Kittatinny, Snyder.

Gooseberries—Houghton.

Strawberries—Chas. Downing, Wilson's Albany.

The Osage orange was recommended for groves, together with black walnut and catalpa.

Although the season was unfavorable, being so dry and many of the earlier peaches having been killed in the spring, yet in the fall we had from time to time, apples, peaches and plums exhibited in our meetings, that for beauty, form, and flavor, could not be excelled. Could we drive from our county all irresponsible tree agents, with their imported trees, and patronize our own nurseries, thousands of dollars might be saved annually to our poor but industrious farmers. I wish the whole State was made to ring with the importance of this, and the planting of groves, especially in the new portion of our State, and thus beautify the footstool of God, and advance a hundred fold our own interest. We have grand possibilities: may God give us wisdom and grace to develop them.

CRAWFORD COUNTY HORTICULTURAL SOCIETY.

(Organized June 14, 1879.)

REPORTED BY THE SECRETARY.

Officers for 1881 are:
President—A. M. Sidwell, Girard.
Vice President—A. Sharp, Girard.
Secretary—N. J. Colton, Girard.
Treasurer—Thos. Ping, Girard.
Meetings are held monthly.

DICKINSON COUNTY HORTICULTURAL SOCIETY.

(Organized in 1877; date not furnished.)

REPORTED BY THE SECRETARY.

Officers for 1881:
President—J. M. Shepperd, Abilene.
Secretary—J. W. Robson, Cheever.
Treasurer—A. F. Hart, Abilene.

NORTH DICKINSON HORTICULTURAL SOCIETY.

(Organized February 1, 1880.)

REPORTED BY THE COUNTY VICE PRESIDENT.

The following are the officers for 1881:
President—Mathew Bryson, Cheever.
Secretary—W. A. Cleveland, Cheever.
Treasurer—C. H. Coleman, Cheever.

DONIPHAN COUNTY HORTICULTURAL SOCIETY.

(Organized October 6, 1879.)

Officers for 1881:
President—X. K. Stout, Troy.
Vice President—S. E. Hardy, Troy.
Secretary—S. Hatch, Wathena.
Treasurer—R. H. Montgomery, Troy.

Meetings are held regularly on the first Monday of February, May, August, and November.

DOUGLAS COUNTY HORTICULTURAL SOCIETY.

(Organized October 3, 1867; chartered May, 1872.)

Officers for 1881 are:

President—D. G. Watt, Lawrence.

Vice President———

Secretary—Sam. Reynolds, Lawrence.

Treasurer—O. H. Ayer, Lawrence.

Standing Committees for 1881—Orchards, O. H. Ayer, N. P. Deming; Small Fruits, E. A. Coleman; Vegetable Gardening, P. Underwood; Entomology, G. C. Brackett; Floriculture, Miss M. L. Macy; Marketing Fruits, B. F. Smith; Meteorology, Prof. F. H. Snow; Lectures and Essays, Mrs. B. F. Burlingame; Vineyards, Martin Sedgwick; Nomenclature, S. W. Pearson; New Fruits, G. Y. Johnson; Music, Jos. Savage.

MEETING HELD JANUARY 17, 1880.

The January meeting of the Society was held in the University, pursuant to adjournment. The roads being in good condition and the weather delightfully pleasant, the attendance was quite large and the meeting a pleasant and spirited one.

At the usual hour D. G. Watt, the new President, called the meeting to order, and after the reading of the minutes of the last meeting by the Secretary, and a song by Miss Gleason, the order of business was taken up.

ORCHARD PRUNING.

As orchard pruning was made a specialty for this meeting, that question was discussed at much length, most of the orchardists present taking part in the discussion.

S. W. PEARSON: Start the top some two or three feet from the crown; allow about three branches to form from the main stalk, carefully avoiding forks; about two feet above these, start another set of branches from the main stalk, and so on, as the tree progresses in size and height. A model tree, both in symmetry and stability, is thus obtained.

The mode of pruning large and neglected trees elicited many and varied opinions, some of which were rather conflicting. Joseph Savage claims that apple trees need but little, if any pruning; while G. C. Brackett, E. A. Coleman, T. M. Pierson, S. W. Pearson, N. P. Deming and others are firm in the opinion that fine marketable fruit cannot be obtained if the trees are allowed to grow at will, without the use of the pruning-knife.

MR. BRACKETT repeated what he stated at the November meeting, about the difference in size and color of the fruit grown on those portions of his Genet orchards which were pruned and unpruned. While the fruit was large, highly colored and nearly all marketable on the pruned trees, but little of that gathered from the unpruned portion was suitable for market.

THE PROPER SEASON FOR PRUNING.

T. A. Stanley thinks it safe to prune in the spring, when the sap flows. He never saw any serious damage by pruning at that season.

Joseph Savage believes that the damage done by spring pruning is irreparable, and if continued the tree would eventually die.

The general opinion, however, was that winter pruning was the safest, and that the tree should be started right and most of the pruning done while it was young, thus avoiding the necessity of cutting off large limbs.

The committee to whom was referred the matter of selecting special subjects for consideration at each meeting of the present year, and designating persons to prepare papers on such special subjects, reported, through its chairman, S. W. Pearson, as follows:

For February—Insect enemies and how to destroy them, by N. P. Deming.

March—Preparation of soil, selection of trees, and planting, by Jos. Savage.

April—Strawberries, variety and culture, by Wm. Evatt.

May—Raspberries and blackberries, their variety and culture, by E. A. Coleman.

June—Culture of flowers and home adornment, by Mrs. F. M. Burlingame.

July—Cherries, peaches and pears, their variety and culture, by G. Y. Johnson.

August—Psychological mission of horticulture, by Dr. Jas. Marvin.

September—Vegetable gardening, by M. Sedgwick.

October—Fertilizers, underdraining, and root pruning, by P. Underwood.

November—Apples, best varieties, keeping and marketing, G. C. Brackett.

December—Election of officers, and reports of standing committees.

MEETING HELD FEBRUARY 21, 1880.

The February meeting of the Douglas County Horticultural Society was held at the State University, February 21st.

President Watt called the meeting to order at the usual hour, and the reading of the minutes of the last meeting was called for. Objection was made to that sentence in the minutes which reads, "The general opinion, however, was that winter pruning was the safest." A motion was made to substitute the word *spring* for winter, but it was voted down, and the minutes stood approved.

PRUNING.

This subject was resumed, and quite a difference of opinion expressed as to the best time for doing this work.

E. A. Coleman, T. A. Stanley and T. M. Pierson do their pruning after the leaves come out. Mr. Coleman explained the *modus operandi* of cutting off large limbs and caring for the wound, drawing an analogy between the animal and vegetable kingdoms. In both cases nature must be assisted by the dressing of the wound, or the healing process will be slow and uncertain. The cut should always be covered with some resinous substance, to exclude the air and prevent the exudation of sap.

DR. MARVIN based his remarks on experience, as well as observation. He said the best time to prune is when there is a prospect of a limb in the wrong place, and this can be done with the thumb and finger. The location as well as the tree and its habits must be taken into account. Buds should not be allowed to grow opposite each other, as this would be permitting the growth of crotches. Large trees whose pruning has been neglected, must be treated with great care. He believes that the best time to prune such is when they are in a *state of rest*, which is between October and March. A surgeon, before he amputates a limb, puts the patient to rest with ether or chloroform, and the organic functions being temporarily suspended, the operation is performed with comparative ease and safety. The orchardist should understand the analogy, and treat his pruning operations with the same careful attention. Many go at their trees as if they were dead, instead of sleeping. Pruning may be safely done at any time in winter, when the weather is open, and no frost in the wood. The doctor considers pine tar the best substance to apply to the cut, and considers the minerals in paint injurious. He has seen old trees rejuvenated with new tops, by cutting off a part of the old wood every year, and budding into the new.

DINNER.

After dinner, and music by a portion of the Old Settlers' Band, the special subject appointed for the meeting, being "Insect enemies, and how to destroy them," was then called up.

N. P. DEMING read a characteristic and lengthy paper on the different noxious insects found in our Kansas orchards, with a description of their habits, and giving the most effective modes of destroying them. He exhibited specimens of each kind, both in the larva and beetle formations.

THE ROUND-HEADED APPLE-TREE BORER.

The beetle of this borer emerges from the tree in May or June, the third year after the egg is laid. It then deposits its eggs in punctures which it makes through the bark; and this depredation is often continued up to September. This borer should be dug out of the tree with a knife or wire in May and October. I have no faith in washes.

THE FLAT-HEADED BORER.

This borer has not been numerous in, or troublesome to, our orchards since the grasshopper year. It works only in dry seasons or on debilitated trees. The flow of sap in a thrifty tree always drowns it. The remedy, therefore, is to keep the tree in a healthy, growing condition.

THE TWIG PRUNER.

This borer does its mischief to young trees by cutting off the main center branch. As yet they have not been found very numerous. They are destroyed by burning the twig in which they are found.

THE PEACH-TREE BORER.

The depredations of this borer on the peach tree are similar to those of the "round-head" on the apple tree—both work near the crown of the tree. The one in apple trees can be detected by the chips, and that in peach trees by the waxy substance emitted. The knife and wire are the only sure way of destroying it.

THE RASPBERRY BORER.

A few of these borers have been found in this county, but not in sufficient numbers to do much damage. The remedy is to cut out all infected canes in the spring, and carefully burn them before the beetle has emerged.

THE TREE CRICKET.

This insect has been discussed in the Society so often that Mr. D. deemed it unnecessary to do more than exhibit a specimen.

THE TENT CATERPILLAR.

The eggs of this insect are attached to small limbs. Before the leaves put out they can readily be seen, and should be destroyed at once. The leaf roller should also be taken in at the same time. A ramble through the orchard in hunting these insects would be time well spent.

THE APPLE-ROOT PLANT LOUSE

Does its work under the ground, and is the cause of many large trees dying. In re-setting trees in his orchard, Mr. Deming finds them quite numerous. The remedy is to pour lye on the roots after removing the surface soil. As a means for their destruction, Mr. Joseph Savage is testing gas lime.

THE APPLE WORM OR CODLING MOTH

Is the worst enemy to the apple we have to contend with. In Lawrence and the immediate vicinity, it has so badly injured the apple for the last few years as to render it almost worthless. This insect was first introcuced here by the importation of Michigan wormy fruit. The warm weather of the past month has changed many of the larvæ into the moth state, which must necessarily perish or starve before warm weather sets in. He believes there will be but few wormy apples the present year. He referred to the report of the Kansas State Horticultural Society for 1878, as giving the best method of destroying this insect.

THE COTTONWOOD TREE BORER

Bores into cottonwood and Lombardy poplar trees, causing them to break off. It remains in the tree until the third year, and then comes out a beetle. The woodpecker destroys this insect by digging it out of its hole. This bird is one of the best friends the fruit grower has, and it should therefore never be killed.

Mr. Deming referred to another pest which the fruit grower has to contend with, and one which is not given in any of the works on entomology. He calls it an insect; but the secretary considers it an inferior specimen of the genus *Homo*. Mr. D. encountered no difficulty in finding a specimen; but, being in rather a weak state of health, was unable to capture him, but succeeded in taking a very comic, suggestive and artistic likeness, which he exhibited to the Society, to the great amusement of all. The portrait contained this inscription: "Kansas ain't a fruit country nohow! Look at my orchard!" Mr. D. further explained this specimen by saying that the negligent man, by allowing his orchard to become a breeding-den of noxious insects to prey upon his neighbors' orchards, was the worst enemy the fruit grower had. He does more to retard the progress of fruit growing in Kansas than all the other insect enemies put together; and the sooner the State gets rid of him the better.

A. GRIESA stated that two years ago he had found the aphis quite numerous on the roots of his nursery trees, and in digging up trees from the same nursery one year afterwards, he failed to find any trace of them, and asked for an explanation.

MR. BRACKETT replied that it was very difficult to understand the workings and habits of those underground insects, but it was well known by entomologists that the aphis had a parasite, and this fact might be a sufficient answer to the question. Mr. Brackett continued, referring to Mr. Deming's report: This insect question is one of great importance to the horticulturist, and requires frequent repetition, especially in view of the fact that our population is increasing so rapidly, and the reports of the Society are sought for, and relied upon as authoritative on all questions pertaining to horticulture.

MR. COLEMAN believed in giving "line upon line, and precept upon precept."

REPORT OF COMMITTEE ON CONDITION OF E. A. COLEMAN'S ORCHARD.

MARTIN SEDGWICK and T. W. STANLEY were called upon to report on the condition of E. A. Coleman's orchard, and the apparent effect of tar on the health of the tree, and the prevention or destruction of the borer. Their report was very favorable, the trees being apparently quite healthy and entirely free from the borer. Those trees where the tar had been applied directly to the bark, were loooking as well, and better if any difference, than those covered with tarred paper.*

SMALL FRUITS.

P. UNDERWOOD called attention to the winter-killing of the raspberry, and gave his theory to be, that as canes do not winter-kill two or three degrees north of here, it must be caused by the growth of new wood late in the fall, the wood failing to harden before the cold weather sets in. He thinks the best remedy is thorough cultivation, cutting back well, and allowing a free circulation of air.

E. A. COLEMAN denies that the raspberry winter-kills, and claims that the damage is caused in summer, by a lack of cultivation and mulching.

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*Refer to report of committee on same orchard, at the May meeting.

H. S. SMITH disagreed with Mr. Coleman, arguing that the raspberry, as well as the blackberry, is subject to winter-killing.

GRAPES.

PROF. CARRUTH called attention to a seedling grape of considerable merit, which is cultivated on a farm in the Cherokee country. It is an early grape, and fully as large as the Concord. He can procure cuttings for any one desiring them.

MRS. F. M. BURLINGAME furnished the tables with beautiful flowers, in pots, in full bloom.

E. A. COLEMAN exhibited specimens of a seedling apple, of good size, which seemed to possess great keeping properties.

METEOROLOGY.

The following is taken from Professor Snow's weather report:

"The present month is the warmest January, and, except December, 1877, the warmest winter month on our thirteen years' record. The month was also remarkable for the entire absence of snow and the unprecedented number of fogs. The high temperature has caused many insects to come forth from their winter quarters, including bees, flies, beetles, and moths. Our fruit growers should search for and destroy the wingless females of the canker-worm moth, which in a few localities are now depositing their eggs upon the apple trees."

At the usual hour, the meeting adjourned.

MEETING HELD MARCH 20, 1880.

Pursuant to adjournment, the Society held its regular monthly meeting at the State University.

The meeting was called to order by the President, at the usual hour, and the minutes of the last meeting read and approved.

E. A. COLEMAN stated that the Kansas Valley Fair Association had appointed a committee of five to confer with a similar committee to be appointed by this Society, for the purpose of working up an interest throughout the county in the coming Western National Fair, and uniting and combining all the producing elements, in order to compete for the premium to be awarded to the best county display, and moved that such committee be appointed. In making this motion, he said, in substance, that other counties were organizing their forces to compete for that prize, and if our county has any idea of winning it, that result can only be attained by united, harmonious and persistent effort. Douglas county has a good agricultural society in the Kansas Valley Fair Association, and the horticultural society of the county is the best in the State, and if all work and pull together, success will be assured.

The motion carried, and the following committee was appointed: G. C. Brackett, T. M. Pierson, N. P. Deming, O. H. Ayer, and T. A. Stanley. Both committees held a conference meeting, but as no report was made to the Society, the result of that conference cannot be reported.

On motion of Mr. Brackett, a committee was then appointed to draw up and present suitable resolutions, expressive of the feeling of the meeting, on the death of Dr. Wm. M. Howsley, of Leavenworth, and also of Mrs. Julia E. McClintock, late a member of this Society. On this committee the chairman appointed G. C. Brackett, Mrs. Joseph Savage, Mrs. Coleman, and Miss L. Macy.

While the committee was preparing its report, Mrs. F. M. Burlingame read the following touching obituary:

IN MEMORIAM.

"Yes, gone from earth; yet
She is not dead, but sleepeth!"

We are called upon to bid a last farewell on earth to our beloved sister, Mrs. McClintock. To-day her place is vacant. At the last meeting we clasped her hand, in the vigor of life and health, and enjoyed the sweet inspiration of her loving, earnest nature. Thus she has passed away, and in going leads our thoughts beyond the limits of this life. Empty words can give no fitting tribute to her memory in this Society. The good we have actually received in our associations with her can be understood only by those who knew her, and we are grateful that she was ours so long. She was devoted to the interests of horticulture, and faithfully encouraged the culture of flowers; and her good example and precepts, and beautiful essays, are dear to the memory of this Society, and will make our hearts purer and softer.

She leaves her husband and her children dear
With us, in this world to mourn.
Be comforted, ye lonely ones:
She is not dead — the Father has called her home.

The obituary committee made the following report upon the decease of Mrs. McClintock:

Whereas, In the dispensation of the wise Ruler of the universe, in removing by death our worthy sister, Mrs. Julia E. McClintock, March 17, 1880, we can but acknowledge the hand that has taken another link from the chain of our membership:

Resolved, That in the death of our worthy sister, this organization has lost a tried and faithful worker — one whose heart and hand were ever ready to do what she could.

Resolved, That we sympathize with the family of our deceased sister in their loss of a loving and faithful wife and a kind and affectionate mother.

Resolved, That a copy of these resolutions be published with the proceedings of this Society.

On the decease of Dr. W. M. Howsley, the committee reported as follows:

Whereas, It has pleased God to call from this sphere of earthly labors, to the rewards of eternity, our esteemed friend and co-laborer in the field of horticulture, Dr. Wm. M. Howsley, it becomes our sad duty, in bowing to the Divine will, to acknowledge the many obligations under which the deceased has placed us by his patient, persistent and faithful endeavors to advance the highest interests of that pursuit in this State: therefore, be it

Resolved, That in the death of Dr. Howsley, this State and community have lost one of their most valuable citizens and the interest one of its strongest advocates; and that we hereby formally express our sorrow at his removal in the midst of his usefulness.

Resolved, That we hereby tender our sincere sympathy to his bereaved wife and family, in this their hour of great affliction, and that the Secretary of this Society be hereby instructed to furnish the bereaved family with an authentic copy of these resolutions, and to cause the same to be properly recorded with the transactions of this Society.

ORCHARDS.

After dinner, which was partaken of by quite a large number, the condition of orchards was discussed. Reports were made and opinions given by several leading orchardists, from which it may be stated that the apple bud is uninjured and the prospect was never better at this season for a full crop of fruit. The same may be said of the cherry. Peach buds are somewhat injured, but it is thought enough sound ones are left to insure a crop. Pears are badly injured, and it is feared the crop will be very light, yet some are still hopeful of a fair crop of this luscious fruit.

SMALL FRUITS.

It appears from the reports on the raspberry, that the canes of the Miami and some other varieties are badly killed. It was reported, however, in all cases, that the Smith's Iron-Clad was sound, and in good condition.

T. A. STANLEY inquired how moles could be prevented from destroying strawberry plants, as his were suffering badly from their burrowing.

MR. BRACKETT informed him that the mole was a great friend to the horticulturist, as it was known to be insectivorous. The remedy for his plants was, to go through his patch every morning, and wherever the mole had worked under a plant, to press it back again to its place with the foot, and it would hardly feel the disturbance.

The Society was favored with the following beautiful poem, composed by Mrs. Joseph Savage, for this meeting:

SCATTER FLOWERS ALONG THE WAY.

In this world of shade and sunshine,
  As we journey day by day,
Let this always be our motto:
  Scatter flowers along the way.

There may be some weary pilgrims,
  Toiling sadly just behind,
Who will feel their burdens lightened
  If our scattered flowers they find.

Or perhaps some tempted, tried one,
  Fainting with unequal strife,
With the world and its temptations,
  May be won from death to life.

By the flowers of patient loving,
Strewn around their path each day —
By the ministry of those who
Scatter flowers along the way.

There are words of joy and comfort,
Words of helpfulness and cheer,
That would make sad hearts grow lighter,
If but whispered in the ear.

There are smiles that bring the sunshine
To the clouded brow of care,
Causing hope to bud and blossom
Into fruitage rich and rare.

There are ministries of kindness,
Self-forgetfulness and love,
Which will scatter flowers of blessings
'Round our path where'er we move.

That the earth may bloom the brighter
While "Our Father" bids us stay,
Let us all adopt the motto:
Scatter flowers along the way!

At this juncture of the meeting the regular order of business was, on motion, suspended, in order to take up the special subject, which was, "Preparation of Soil, Selection of Orchard Trees, and Planting," by Joseph Savage, who presented the following paper. Mr. Savage brought with him cions, rootlets and young trees, with which to explain and illustrate his methods and practice:

Mr. President, and Members of the Douglas County Horticultural Society: In presenting my ideas upon the subject assigned to me to-day, it cannot be expected that they will harmonize precisely with the views of all my fellow-members, and I would at the outset bespeak for my remarks a kind consideration and courteous treatment. Horticultural subjects take so wide a range that opinions will necessarily differ, and while it is perfectly right and proper that we should make known these differences to one another, we should never for a moment lose sight of that delicate sense of propriety and respect for the honest opinions of others, which we are so careful to claim for our own.

The first division of my subject, that of preparation of the soil, presupposes the orchard site to have already been chosen and located. Time was when this Society spent much time in discussing this question, but it is now some years since it has been pretty generally acceded that any situation that will grow good corn will also be a good place for an orchard. Indeed, contrary to the opinion of a majority of our early membership, we now find some of our most productive and profitable orchards in the county located upon the first and second bottoms, and what is more surprising still, perhaps, is the greater freedom these low situations enjoy from the ravages of the round-headed borer. Why this is so we cannot readily explain. It may be the greater heat of the sun, caused by more sandy soil, making it a little too dry and warm for congenial hatching-places. I am inclined to think, however, that the principal cause of the greater exemption of bottom-land orchards from the round-headed and flat-headed borers, is owing to their near proximity to timber, and consequent visits of woodpeckers. The great value of woodpeckers in keeping orchards free from borers is not sufficiently appreciated or as generally known as it should be, and the penalty for killing these useful birds should be made more severe and be more strictly enforced. Where a few woodpeckers frequent an orchard, little trouble will be experienced from borers — a fact attested by general experience.

I think all will agree with me that the only proper

PREPARATION OF THE SOIL

Is by thoroughly subsoiling it. The several methods of attaining this result will readily suggest themselves to the minds of every practical farmer.

The obvious reasons for this procedure are — first, to give uniform drainage to the soil; and secondly, to furnish the only fitting resting-place for the growing tree which it can possibly have, where the rootlets can lengthen and take a firm hold and feed upon the soil.

My second division,

THE SELECTION OF VARIETIES,

Is one upon which opinions vary, and which the wisest of our number must still assume the attitude of a learner. If I had my orchard planting to do over again I should set out fewer of the earlier apples, such as the Early Harvest, Red Astrachan and Carolina Red June, and more of the Porter and Cooper's Early White; though the Red Astrachan has this to recommend it — its fruit does not ripen at one time, but continues through a couple of weeks. The Early Harvest decays so very soon and is so very shy in bearing, that I would be shy of that variety. Another thing I would avoid, that is to keep clear of planting any varieties of small apples for market, such as the Gilpin, Fameuse, American Summer Pearmain, Red Winter Pearmain, and others.

The Maiden's Blush produces well, and stands shipping as well as any variety of fall apples. The Lowell is also very good; so is the Rambo and Chenango Strawberry. The Wine is not as satisfactory as the others mentioned — trees blight and the fruit is soft and imperfect.

Of the winter varieties that ripen in the fall, I would mention the Northern Spy. Though coming into bearing late, it is making for itself an enviable record for fruitfulness. The same may be said of the Yellow Bellflower, only more would be true in regard to its quality. It cannot, to my knowledge, be excelled. The Baldwin is another apple that deserves a place in the same catalogue of the winter varieties. The Ben Davis, on account of its size, color, and bright, clean wood, deserves a place at the head of the list. The Missouri Pippin, on account of early bearing and productiveness, stands well-nigh by the side of the Ben Davis. The Winesap, for quality and productiveness, is all that could be desired, and a long as it is kept in full vigor of growth it fills the bill; but as the vigor of the tree slackens, the quality of the fruit deteriorates.*

The Rawles Genet holds a large place in the affections of the masses of the people, though the dealers in fruit turn up their noses sometimes when we offer them in market on account of their small size and want of color. The tree is a careful, wary grower, never known to send out long tender shoots for the frosts of autumn to wither; but it is wonderfully careful to ripen its wood as it grows. Its bark is clean and healthy, and its tendency to overbear is one of its greatest faults. It is the last tree of all in the orchard to leaf out in the spring, and consequently its fruit in the fall ripens late—so late that it often cracks badly after the fall rains, and thus becomes unfit for a winter fruit. My neighbor Briggs, just across the way from my place, tells how one spring a man came along the highway, and stopping his team, inquired what had killed so many of his apple trees. He laughingly told him they were all Rawles Genet, and had not yet leafed out.

Then there is the Rome Beauty, of which I am at all times proud—so symmetrical in form and so fair; the Willow Twig, a large, productive and healthy tree; the Jonathan, so delicate in leaf, bud, and woody texture, and fruit so finely colored, spicy and nutty in its flavor. The Grimes's Golden is one of our best late keepers, with flavor almost equal to a pear. The Minkler, which we used to hear a great deal about, has not, so far as I can learn, much to recommend it except its rank growth. The Stark has the largest and best matured buds of any variety I am acquainted with; its fruit is of good size, and it is with me tolerably productive, I am aware that nearly every member present would be glad to rise in his seat and add some one or more favorite variety to the foregoing list; therefore I will give an opportunity, by passing on to the last division of my subject—

PLANTING AN ORCHARD.

Before entering upon the discussion of the size and age of trees best suited for planting, I may indulge in the privilege of giving a brief history of the apple tree before it passes out of the nurseryman's hands.

The apple seed from which the nurseryman grows his stock for market are either bought at the seed store or washed from the pomace of the cider mill. The seed, being heavier, sinks into a box prepared for it, while the pomace floats away upon the water. These seeds, if dried, are soaked and frozen, then planted out one year and sometimes two; upon roots thus grown, we graft the different varieties which the market seems to demand. These roots, if well grown, will each make three grafts by dividing them into sections. The length of the sections varies from three to four inches. Do you ask me if I would recommend trees grown from sectionized roots above those grown from whole roots? I would answer that I do, most decidedly. For when we plant whole roots, the side or branching roots are of feeble and weak growth, while in the short sectionized root the tendency of the sap to flow downward is arrested, and we notice a wonderfully strong development of the side roots thrown out upon all sides to support the tree; and my experience is, that they stand much firmer in the soil than if worked upon the whole root.

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*So does the Missouri Pippin.—Sec'y.

The principle which underlies the propagation of the apple, whether by budding or grafting, is all the same, and is based on the fact, that in every well-developed bud there is incased a tree in embryo.

No doubt you are all aware that our grafting is done in the winter, and the grafts packed away in the cellar, and that it is away down in the darkness of the cellar the union of the cion to the root is begun; and when the warm spring days come, and the grafts are set out in the nursery rows, the leaves very soon put out above ground, and the small, tiny roots begin to put out after nutriment and moisture below the surface. In the fall, after one summer's growth, we have a top from three to five feet high, and a well-defined system of roots below. Another summer's growth, and the top or head is well formed, and the roots have attained considerable size and length, and the tree is no doubt then in its best estate to be transferred to its final destination in the orchard, though I have transplanted trees as late as six years of age, with flattering results.

It is, as has often been stated in these meetings, the duty of the nurseryman to so trim and shape the tree in the nursery as to give it its general character for all coming time; but it should be borne in mind that all varieties of trees do not require the same treatment, and even trees of the same variety are treated differently, according to their habits and dispositions, just as we often find children in the same family with varying dispositions, needing almost opposite methods of training. But here the simile ends, for with the tree the sprouts are taken off, while with the child they quite often need putting on.

With regard to the distance from each other the trees should stand in the orchard, I am not fully persuaded in my own mind, several more years' experience being required to decide this question. Thus far in my experience the trees grown in double rows have not produced fruit enough to pay me for the trouble of growing them; and besides, I am not quite satisfied that trees grown in too near proximity are as free from disease, and as sturdy and hardy as those set further apart. I am suspicious that they are not as well fitted for the roughness of living as those set out in regular orchard rows. I will simply say that my advice is, to "let every one be fully persuaded in his own mind as to the distance trees should grow, and then act accordingly; for if the owner of an orchard is satisfied, the rest of the world should be."

Of the many ways to first lay off orchard rows, I think best the one adopted and described by our late townsman, R. C. Tasker. It adopts the quincunx plan, and is, in short, as follows: First, the outside row is staked to the distance desired for the trees to stand; then a rope or chain is taken of twice the desired distance in length the trees are to stand in the row; a fixed loop or ring is adjusted to each end of the rope, and also one in the middle; the rope or chain is manned by three persons, two of whom man the end loops and follow along the outside row already staked out, placing the loops over the first two stakes; the third person at the middle loop is equipped with a bundle of stakes, and drives one at the apex of the triangular rope for the first tree in the second row, and thus as the triangle moves across the first line of stakes, the second row of stakes is stuck for the second row of trees; then the men at the end loops are transferred to the second row of stakes, and the third man sets the third row of stakes, and so on through the whole orchard in the same way.

The ground staked off, the planting of the trees is next in order, and it is one of the most simple of all our horticultural work. An ample hole in the mellow soil, the tree adjusted, and a vigorous trotting or jerking of the tree up and down to settle down the soil well among the roots, and the firming down of soil on the top, and the work is done. Screening the roots from the air and sun as the work progresses, is a matter so well understood that I barely need mention it.

The future prosperity of the tree is greatly enhanced by being careful to trim the root ends that are mangled, so that from these smooth cuts a large number of small rootlets may put forth.

I must differ with many writers upon horticulture in regard to trimming the tops of trees severely before transplanting them. This is the way they generally express it: "Trim the top to balance the roots." I am persuaded that no more fallacious doctrine is extant, and I would express the idea in their way: "Leave on a good generous top, so that if the roots are short, few and small, they can have left them the power to grow and balance the top." It is true that there are times when this rule is not to be observed, and that is when, like one year ago this spring, the sun burns out scalding for many days in succession during the season for transplanting, and the ground is dry and baked; then the newly-planted tree may be said to be enfeebled, and heavy trimming is resorted to to save its life.

I still hold to level culture in an orchard, and no plowing up the soil toward the trees ought ever to be tolerated. The best growth of the tree is only secured by leaving the crown and the roots undisturbed upon the surface near the air and sun. I still believe that hogs, if allowed free range in an orchard after it has attained a sufficient age, and not overstocked with them, are of great service as a matter of economy by keeping down the weeds, especially the glory flower, eating all the windfalls and thus destroying very many insects; and by stirring the soil with their snouts by their frequent rootings, and further by their frequent rubbing and scratching themselves upon the trunks of trees, help keep away the beetles from laying their eggs upon them. They also destroy the poor surplus fruit upon the lower limbs, and thus allow the best specimens that grow up in the light and sun.

I have sown clover in my orchard, upon which the swine feed greedily; and when they have clover to eat they seem to be the best contented pigs in the world.

Now if any of you do not hold the same views as herein held forth, do not allow mine to disturb your peace of mind, and I will agree to be one of the last persons in the world to be disturbed thereby.

The discussion on this paper was, on motion, postponed till the next meeting, to be taken up under the head of orchards.

PLANT LIFE.

PROF. SNOW made a very interesting address on the "Phenomena of Plant Life," citing experiments made by President Clark, of Amherst College, to show the wonderfully expansive power of the vegetable world. By an ingenious mechanical contrivance with iron bands and lever, he had succeeded in measuring the expansive power of a squash, which at maturity had exerted a force of 5,000 pounds. The roots and rootlets confined in a box of another plant measured 80,000 feet, or more than fourteen miles.

The great length of this report forbids any further review of this interesting address.

MEETING HELD APRIL 17, 1880.

The April meeting of the Society was held at the University.

Immediately after dinner the meeting was called to order by the President, the minutes of last meeting read and approved, and the subject of

ORCHARDS

Announced. The reports made of the prospects of a full crop of apples the coming season could not be more hopeful or sanguine. All varieties, from *early summer* to *winter*, are loaded with bloom, and if nothing occurs to destroy the embryo fruit, Douglas county will have the largest crop of apples, by far, ever gathered here.

In reviewing Mr. Savage's paper on orchards, read at the last meeting, his method of planting young trees was objected to by T. A. **STANLEY**, who thinks the fine soil can be placed around the roots and rootlets better with the hand than by "churning" the tree up and down for that purpose. Mr. Savage's plan, however, received the general indorsement of the meeting. The potato fork was spoken of as being the best implement for planting trees, as it is not only lighter and more easily manipulated than the spade, but it pulverizes and loosens the soil better than can be done by any other means.

E. A. **COLEMAN** and H. S. **SMITH** fully indorsed Mr. Savage's method, and they say about fifty trees, well planted, make a good day's work.

MR. SAVAGE recommends the largest trees from a lot of the same age, as they are always the most vigorous. It is a very common error with the inexperienced fruit grower to prefer the smallest trees, believing they grow more readily. Nothing can be more fallacious.

MR. DEMING reported progress in transplanting trees from seven to ten years old. He finds it laborious, but thinks it will pay much better than grubbing out and throwing them away. Three men and a team can dig up and transplant into a new orchard about a dozen in a day. He cuts the roots off at a distance of about two feet from the tree, takes great pains in not bruising the trees or roots, and is confident that he can make every one grow.

MR. WATT in 1868 transplanted a lot of eight-year-old trees, with as much success as with two and three-year-olds; of course the labor and care necessary were much greater.

Again Mr. Savage's plan of cutting back all long roots before planting the tree, was favorably spoken of. By pruning the roots into a compact system, the tree will stand firmer and be more likely to grow erect. The roots should be trimmed smoothly with a sharp knife; the cut will then heal over readily and send out numerous fibers which at once take root and start the tree.

DR. MARVIN explained the different effects of smooth-cut roots and those that are bruised; the former immediately send out new rootlets while the latter frequently rot away, retarding the growth, if not endangering the life of the tree. This fact he has ascertained by actual experiment.

MR. AYER, a gentleman from western New York, an extensive fruit grower was present, and many being anxious to know how they did things in that state, he was plied with many questions — in fact, too many to be all repeated in this brief report. The gist of his answers, however, was as follows. Fruit growing there is made a very profitable business. Many of the orchards are quite large, producing thousands of bushels. His own orchard produced last year between three and four thousand bushels. Most of their apples are shipped to the London market. Their orchards are infested with insect enemies just as badly as in Kansas. He has known many neglected orchards to be entirely destroyed by them; but it is no difficult matter to keep them out by timely using the proper means. They rely, both as a remedy and preventive, upon a wash made of two parts wood ashes and one part lime, with a little sulphur and Paris green thrown in. This wash is mixed to the consistency of paste and applied to the roots, after removing the soil with a hoe, for the purpose of destroying the aphis or root louse; and the trunks and limbs are washed, to prevent the operations of the round and flat-headed borers.

When large trees, of from six to ten years old, are to be taken up and transplanted, the roots are cut off in a circle of four feet around the crown, in September. The next spring, when the tree is taken up for transplanting, the roots thus cut off are not only healed over, but fibers are started from every cut, and the tree starts into growth as readily as a two-year-old from the nursery row. After spending a number of weeks here examining Kansas orchards, he concludes that fruit can be grown just as successfully here as in any part of New York.

SMALL FRUITS.

P. UNDERWOOD reported his blackcap raspberries seriously damaged by winter-killing. He will not have more than half a crop. The Iron-Clad does but little better with him than the Miami and other varieties. Portions of his Turners are all right.

H. S. **Smith** stated that about one-fourth of his Turners were killed down half-way or more. Smith's Iron-Clad was entirely sound.

Mr. Smith, the propagator of the Iron-Clad, was present, and stated that his favorite had stood in the rows twelve years without renewing, and was still bearing well.

From all the reports made, it may be concluded that the raspberry crop will be light, the Smith's Iron-Clad being the only variety promising a full yield.

The canes of all varieties of blackberries were reported sound, and a good crop is anticipated.

Dr. Evatt, to whom was assigned the subject of strawberry culture, was unexpectedly called from home, in the morning, on important business, which proved a great disappointment. The reports, however, from several strawberry growers present, gave promise of a good crop of this luscious fruit.

A vote of thanks was tendered the singers, Miss Kate Smeed, Miss Miles, Miss Yarnold and Mr. G. Smith, for the excellent music rendered during the meeting.

FLORICULTURE.

BY MRS. F. M. BURLINGAME.

Mr. President: It is now time to sow seeds of phlox drummondii, petunias, sweet williams, zinnias, double white chrysanthemums, and sweet peas. The 1st of May is soon enough to plant seeds of sweet alyssum, mignonette, nasturtiums, and climbers, such as madeiras, cypress vine, and purple runner; the 10th of May is soon enough to put out bedding plants, except in high, warm, protected situations. Let no one fail to put out two or three verbenas, a double white feverfew, a heliotrope, and a few geraniums. The east side of the house is a good place to set heliotrope and feverfew; yet, if the ground is kept thoroughly moist, they succeed in full sunlight.

Now that spring is here with Nature's sweetest offering—an abundance of flowers to decorate our tables—let us give a little thought to the arrangement of these poetic gifts. I heard an essay read on "Cut Flowers for Table Decoration" that pleased me very much, and perhaps our horticultural friends will be pleased to hear it. I give an extract of it from memory, that embraces the practical part of the essay. It is said in the cookery books:

> "If the woodcock had but the partridge's breast,
> 'Twould then be the finest bird ever was drest,
> Or the partridge had but the woodcock's thigh,
> 'Twould sure be the finest bird ever did fly.

The exhibitor of roses is fain to add the graceful frond of the maiden-hair fern to back the brilliant rosebud, but the fern bears no resemblance to the natural foliage of the rose. If a pinnate leaf could be found to equal the fern in gracefulness, it would be a very desirable acquisition for table decoration. Nature has generally supplied leaves of more or less beauty as a back or foil to flowers, and we cannot greatly err in imitating so good an example in our artificial combinations. The fair colors of the rainbow ride upon or span a dark cloud, and its beauteous tints are thereby enhanced in brilliancy. The leaves of the plant we are about to recommend are not tenacious of life, for if left out of water but a short time they dry up beyond all power of revival. It is a brightish plant, fond of rich soil and plenty of water, and when used for house decoration with flowers that are to stand in the water, this failing of fondness for water becomes a virtue, and the leaves really enjoy the indoor life. This is none other than tansy. The leaves being pinnate and interruptedly cut, seem by nature meant to adorn, and it falls in admirably with all roses and brilliant flowers, whose stems of course must be immersed in water. The grasses and everlastings are elegant plants, and have no need of water to preserve their beauty; and this is no small recommendation to some who are so peculiarly placed that they could not keep flowers in water.

Some may think the arrangement of flowers of little importance. If so, why are premiums offered for the best? and what becomes of the millions of nosegays that the Hebrew maidens manufacture in what one might call the "button business," where a single geranium leaf is the background, and every flower, however plain, is mated to form the face? I have watched the craft at work, and have seen sprigs of asparagus tied firmly to a shabby truss of Tom Thumb geraniums, or a phlox, to form a "posy knot," charming, wild, and disorderly.

Let no one speak or think lightly of flowers to make home cheerful. Let us carry a few to the table by the bedside of the invalid. Let us bring our flowers on festive occasions, that they may play an important part in the merry-making. Like the music, they are part of the get-up, since the decoration of the table would be the talk of the guests for many years to come. It was only following the true spirit of merry-making that made the Northern minstrel say:

> "A Christmas gambol oft would cheer
> The poor man's heart through half the year."

MEETING HELD MAY 15, 1880.

Early in the morning, crowds of horticulturists and their friends were seen wending their way from all points of the compass toward the residence of E. A. Coleman, in Kanwaka township, the objective and grand central point of attraction. By 10 o'clock A. M. his walnut grove was well filled with the *elite* and intelligent of the county, dressed in their Sunday attire, with faces beaming with delight, responsive to the cloudless sky, the balmy air, the smiles of Nature, dressed in her loveliest green, the singing of the birds, the humming of the bee, and the all but enchanting surroundings of the place. Nothing could be lovelier than the prospect we attempt to describe, but utterly fail in the attempt.

BUSINESS.

About an hour before the announcement of dinner, the meeting was called to order by President Watt, and the minutes of the last meeting read and approved, after which the members were asked to state what facts they possessed on the condition of

ORCHARDS.

The expressed opinion and observation of several of our principal orchardists were in effect that apple trees generally were in a healthy condition, and nearly all varieties were promising a full crop of fruit. The Rawles Genet, which bore so full last year, will in most orchards produce another full crop the present season.

MR. THOS. W. PEARSON's orchard is bearing full, with the exception of the Rome Beauty and Wine.

MR. MCCLINTOCK's young orchard is bearing full enough.

MR. O. H. AYER has a good prospect for a full crop of apples. The Porter and Large Yellow Bough are the only kinds bearing shyly. His pears are all full except the Howell, which has but little fruit.

MR. G. ELIAS, of Washington creek, has a prospect for a full crop of apples; and so on, the reports being much the same from all parts of the county. In connection with orchards, the round-headed apple-tree borer was discussed. From all that can be gathered, its depredations are much less this year than formerly, and it is to be devoutly wished that its race, like that of the tent caterpillar, is disappearing. Mr. Elias called attention to a very friendly and useful bird on his premises which he calls the "Quilt." It is allied to the woodpecker and sapsucker varieties, but a little smaller and without red on the topknot. Its breast is white and its wings black. This bird makes a specialty of digging out borers. Its life and liberty should be sacredly respected and protected, and its increase encouraged. Anyone, however poor a shot he may be, who attempts to shoot one of these birds, should be disfranchised and sent to Osawatomie or Leavenworth for life.

JUDGE EMERY gave his experience in orchard growing, which was, in brief, as follows: Several years ago he found that many of his apple trees were sickly, and some dying. He employed an expert to investigate the cause, who found, and extracted from them, a large number of the round-headed borers. In this orchard he lost in all some 175 trees, which he replaced with young ones. He was recommended to get gas lime from the gas works and place about a shovelful around each tree. This he did; since which he has found the borer in but three of his young trees. This lime has a very strong odor which is emitted after every rain, and which is thought to be very offensive to the delicate senses of the beetle of this insect. The Judge strongly recommends the use of it.

MR. JOSEPH SAVAGE has used this lime in the same way, and indorses and confirms the statement of the Judge.

MR. WATT took occasion to caution the members against planting that variety of apples known as the King of Tompkins County. It has proved to be a very unhealthy and short-lived tree, and not worthy of a place in the pomological nomenclature for Kansas.

SMALL FRUITS.

The subject of small fruits being the special one for this meeting, and E. A. COLEMAN being the member to which it was assigned, was called upon for his experience with the raspberry and blackberry.

He said he had not prepared any paper on small fruits; he never advised any one what to do, or how to do it; but he was always willing to give his methods and tell his experience, leaving others to think and act for themselves. As the Society was now at his place, it could now study an optic lesson; everybody could now go and see for himself how he planted and cultivated those berries.

For the benefit of those who did not enjoy that privilege, the Secretary would say that Mr. C. does not cultivate his blackberries, further than pinching back the young shoots, taking out the old wood as soon as the bearing season is over, keeping them in rows by cutting the canes off close to the ground, which sprout between the rows, and by thoroughly mulching with hay or straw. The mulching not only keeps the weeds back, but preserves the roots from *summer-killing.*

The raspberry he treats entirely differently. Instead of mulching, he cultivates early and often during the entire growing season. He has been through his plantation with the cultivator five times already, and has only just commenced. This he claims to be the true secret of raising a full crop of fine raspberries. His large plantation of both blackberries and raspberries is so loaded down with the fruit that they are a marvel to look upon.

The subject was continued by reports from different members.

MR. UNDERWOOD'S prospects of a full crop of raspberries are better now than at the last meeting. He says the blackberry canes seem to be well filled with blossoms even on lowlands, where they so frequently winter-kill.

MR. H. S. SMITH considers the Snyder blackberry a hardy variety, and worthy of culture.

THE STRAWBERRY.

It was reported that the strawberry was suffering from the drouth, and if rain did not come very soon the crop would be cut short.

COMMITTEE TO EXAMINE CONDITION OF MR. COLEMAN'S FRUIT GROUNDS.

On motion of Mr. Sedgwick, a committee was appointed to inspect the premises, and report, especially the apparent effect of the tar used, as to the health of the trees, and as a preventive of the borer.

The following report was made:

We, the committee appointed to examine Mr. Coleman's orchard, to investigate the effects of tar as a preventive against borers, would most respectfully report that in our opinion tar is no preventive, as we have examined five trees and found borers in four, said borers being of different ages, which indicated that ravages have been commenced since the tar was applied; and we would recommend, as the only sure remedy, a thorough examination of orchards during the months of May and October of each year, using a chisel and knife to destroy this insect. We are unable to determine the effects of tar upon the general health of the tree.

We find Mr. Coleman's blackcap raspberries in a fine promising condition, canes heavily loaded with fruit. The Turner has but little. Blackberries look well.

N. P. Deming.
T. M. Pierson.
O. H. Ayer.

METEOROLOGY.

Mr. Joseph Savage stated that a prominent theory now advanced was, that cyclones were the result of too much electricity in the clouds, and this superabundance of electricity was caused by having so many railroads all over the country. If a person must be killed by lightning, or blown out of existence by a cyclone, it is a great comfort to know the cause.

MUSIC.

One of the pleasing features of the meeting was the fine music rendered by the "Old Settlers' Band."

After a hearty vote of thanks to Mr. and Mrs. Coleman and the band, the meeting adjourned.

MEETING HELD JUNE 19, 1880.

The regular monthly meeting of this Society took place, pursuant to adjournment, in the beautiful walnut grove of Mr. Jos. Savage.

As usual, the members were called to order before the announcement of dinner, and the usual order of exercises commenced. The minutes of the last meeting having been disposed of in the usual way, the report on

ORCHARDS

Was called for, and the leading orchardists present interrogated on the condition of orchards throughout the county, and the crop prospects of the different varieties. From the verbal reports presented, it seems that apple trees generally are in a healthy condition, with the exception of a little blight manifesting itself in certain localities. It appears also that the crown borer is doing less damage this season, so far, than heretofore. The prospect for a large crop of fruit is no less bright now than at the last meeting. Although a large quantity of young fruit has been blown off the trees by the recent high winds, yet enough remains on nearly all varieties of trees to produce a full crop. It is a fact to be noted, however, that where orchards have been well cultivated, fruit has dropped but little.

W. E. Barnes has never before had so fine a prospect for a full crop.

T. M. Pierson will have a full crop on all varieties except the Fameuse, Buckingham, and Seek-no-further, and these will bear a partial crop.

S. W. Pearson called attention to the fact that he has six trees of the

Hoop variety, whose bloom was killed some four years ago by a cold northeast wind on that side of the trees; the southwest side bore full. Since that time each half of the tree has borne alternately, giving him half a crop each year.

PEARS.

This fruit fails to give satisfactory results, on account of its liability to blight. Several members expressed a determination to discontinue its culture, while others, more hopeful, believe that the true way is to keep on trying till we obtain varieties that are suited to our climate and soil, and are blight-proof.

MR. BARNES, whose pear orchards are underlaid with a stratum of sandstone, seems to be an exception to the rest of the county, as he has had no blight in his orchard since 1873, and will gather a large crop of fruit the present year.

JOS. SAVAGE desired to retract what he had said against the Early Harvest apple at a previous meeting. The variety is bearing so well this year that he is now inclined to recommend it.

SMALL FRUITS.

S. W. PEARSON strongly recommends the planting of the raspberry in young apple orchards, as the shade is beneficial to the canes, and the extra cultivation required is very helpful to the young orchard. Both do better thus planted.

VEGETABLE GARDENING.

As ex-President **SEDGWICK** is considered an adept in this department of horticulture, he was called upon for remarks. He said, in substance, in his humorous way, that there were three kinds of gardeners:

1. The gardener for pleasure is generally of one of the learned professions, lives in a fine house, with handsome surroundings. He does all his work by proxy, for if he did it with his own hands it would mar the pleasure, and be likely to soil his kid gloves and damage his embroidered slippers. You see him light his cigar and stroll through the garden. He sits down in a rustic chair under the grape-vine, puffs away at his Havana and oversees his proxy. Now smoking in the garden is a very useful thing; it keeps the gnats and mosquitoes off one's face, and the tobacco ashes are good to kill cucumber bugs. Smoking in the garden, therefore, combines business with pleasure. He then walks leisurely over the garden, eats a raw onion to spite his wife, picks a bouquet for the hired girl, and walks back to the house.

2. The gardener for profit must be a man of prudence, energy and industry, and must be never weary in well-doing. He must be willing to rise at 4 o'clock in the morning and work till 9 at night, in order to supply Mrs. B. with two bunches of asparagus, and three of onions by 5 o'clock in the morning. This he must do or lose his trade, for bear in mind, he is gardening for profit. Some people think that any cabbage-headed, squash-brained man can be a good gardener, but in this they are mistaken. He should at least be a

man who knows *beans* and minds his *peas* and *cucumbers*, and though he may often deal in beets, he should be no DEAD *beat* himself; and though he often deals in green corn, he should never be *green* enough to get *corned* himself, for that would cause his nose to become a little *reddish*, and his eyes to look like *ripe tomatoes*, and he would have more vegetables on hand than he could take care of. A good gardener will never be a Micawber, sitting around waiting for something to turn up, but will go to work and raise his own *turnips*. He should also be a man who can get a large amount of work from a small amount of hired help. Again, he should be well versed in scripture. For instance, if his men who are hoeing in the garden become very thirsty before noon, he should teach them to obey that divine injunction: "Ho, every one that thirsteth."

3. The man who gardens for home use, differs entirely from the two just mentioned, because he is generally a *woman*. The home garden is made something like this: in early spring, as soon as the frost is out of the ground, without waiting for it to dry, the garden is plowed and planted. This is done in order to have vegetables very early. The garden is not thought of again till about the first of May. Then nothing is up but what the dogs and hens have scratched up. So they go to work and plow and plant it over again. The garden is left again till the weeds take possession. The home gardener hoes a little around, and mows a little between the hills, but soon tiring of this, it is concluded that the vegetables will be so late they will not be worth having this year, but next year they will have a good garden, and have it as early as anybody else. So the home garden goes by default.

HORTICULTURAL CHEMISTRY.

Prof. Patrick being present, was called upon for an address. He very kindly responded, taking for his theme, "Horticultural Chemistry." I shall not attempt a report of this scientific and interesting address, but merely indicate the line of thought taken by the speaker.

To understand vegetable phenomena, it is best to compare the animal with the vegetable kingdom. Animals take in food; so do plants. Some plants possess the power of locomotion to a certain extent; these are mostly aquatic. Yet other plants, like the sunflower, have the power of turning themselves. Then there are carnivorous plants, which seem to watch for certain insects, capture and live upon them. Animals go to rest; so do plants stop feeding at night and go to rest. Animals inhale oxygen, and could not live without it. The fact has been fully established that plants would die without the presence of this gas.

The Professor explained how force or energy, like matter, was indestructible. Animals receive their energy from food, while plants from the solar influences. The province of plants is to take in force and hold it latent, to be used by man for service in the world. The Professor explained at some length the composition, structure and growth of plants, and the different processes through which fruit passes up to the stage of ripening.

The above is but a crude outline of the interesting address.

The following poem and essay were then read:

MEMORIES OF HOME AND FLOWERS.

BY MRS. O. H. AYER.

"Providence gives us no greater worldly gift than the gift of home."

How sweet are the memories of home,
Place of our affections dear,
And sweeter still the scenes of youth,
When our skies were ever clear.
What gave the landscape color bright,
And skies the roseate hue?
What sweetened all of our young life,
And showered upon us dew?

What soothed the pain of bramble and brier?
What turned our fear to love?
What was it strengthened our young minds,
And pointed us above?
'Twas flowers, sweet, sacred flowers,
To our memory an index bright,
Of innocence, of faith, and love,
Of friendship and delight.

Of tiny griefs which to us then
Like mountains great did seem,
Of lessons, all unlearned, strict discipline in school—
Of cares that darkened our young dream.
Sweet flowers that bloom in spring,
Violets, Bluebells, Snow-drops white,
Pansies, Lilacs, Pinks and Tulips,
They were all my heart's delight.

Later, roses wreathed the gateway—
Damask was dear mother's choice—
Roses, Velvet Moss, and climbing,
All made our young hearts rejoice.
Sweet Jessamine—I seem to see it still—
My parents taught me how to train,
In days gone past, in happy days,
I ne'er shall see again.

In other arbors I see it oft,
And o'er my soul the while,
Steal memories sadly sweet, that bring
A deep sigh and a smile.
And when sweet, sunny days were o'er,
And winds blew chill and cold,
'Twas then we saw the beauty of
The Artimisie and Mary Gold.

Yes, we learned to love the beauty
Of sweet flowers that lingered long
Amongst the fading foliage,
For they seemed like a last sweet song.
How we revered the evergreens,
Those soul-inspiring trees —
Yes, the tall, majestic pines,
Ever sighing in the breeze,
Seemed to help us in our lessons
While on our way to school —
Helped to raise our aspirations,
And make clear the mystic rule.

Then came the Weeping Willow,
Sighing, and with a moan —
Seemed singing a requiem
Gently o'er some grave alone.

To life there is a sunny side,
'Tis always in our sight,
And why not choose this pleasant path
And ever walk in light?
Then let us cultivate sweet flowers,
By our kind Father given,
For there seemeth to be a blending
Of Home, Flowers, and Heaven.

HOME ADORNMENT AND FLOWERS.

BY MRS. F. M. BURLINGAME.

Floriculture and home adornment was the subject assigned me, but not feeling equal to the learned treatise on the science and art of floriculture and landscape gardening, I have taken the liberty of changing it to home adornment and flowers, as more appropriate for the thoughts I shall present on this occasion.

Home adornment includes everything that makes home happy, pleasant, and beautiful. The house itself need not be expensive in order to be beautiful. It is better that it be not too large, consuming the best part of the housekeeper's life to keep in order. It may be small and humble, and yet be convenient to work in, pleasant to live in, and fair to look upon.

It has been strongly advocated by writers and speakers of late, that a good kitchen means home. They say that if they could have only a small house, they would have but one room, and that should be the kitchen. This may do very well for maidens and bachelors, but I would not advise the wives of our farmers and horticulturists to cook and eat, wash and iron, read and sew, sleep and live, and raise their babies in the kitchen. The most circumspect teakettle boils over sometimes, hot suds will spill on wash-day in the most careful hands, and hot oven doors are prone to be open more or less. I cannot think it best to subject little children to the heat and steam of the kitchen, to say nothing of the dangers and accidents to which they would be exposed.

Those who have investigated the subject, tell us that the rate of mortality among children under five years of age is largely increased when they are kept in the kitchen all, or a large portion of the time. From observation, I have concluded that the most comfortable and practical house for married persons of small means is, a dining room, with bedrooms above, and a small kitchen adjoining. An eight-by-ten room will do, if well lighted and ventilated, and furnished with a cook table full of drawers, a large cupboard with a door, and a few shelves on the wall above the stove and table. Have the dining room as large as you can afford — twelve feet square is better than none, but fifteen by eighteen makes a good room. There should be east and south windows to this room, to admit of an abundance of sunlight. By closing the partition door while the culinary arts and laundry work are going on in the kitchen, this room can be kept full of pure air, and of even temperature; and the children can be left there safely, and the home-keeper can open the door occasionally to see that all is well with them.

I once asked an aged grandmother how they managed their babies after they could no longer be kept in the cradle, when they lived in one room, with one side of it taken up by a broad fire-place and a blazing fire. She said, "We put a woolen mat on the floor by the bed-post, and kept a soft leather strap tied to the post, with a buckle on the end, and we just buckled it around their waists; then we could go on with our work, and feel sure they could not get into danger." I hardly think Young America could be brought up in that way in these days. It might do for a few minutes, as amusement, but when it meant business, and all the time, there would be a revolt, and a declaration of rights. Let us give our children a safe, wholesome room to creep and play in.

This dining room can be made cosy, comfortable and beautiful by furnishing it with a dining table, a few comfortable chairs, a lounge, a book-case, a mantel, a newspaper rack, and flowers and vines. A home like this will make any good woman happy, so far as temporal things are concerned, and as time prospers the pair they can add the drawing room, the sitting room, the parlor and spare bed room to suit their taste.

The ingenious housekeeper can adorn the library, living room and dining room all in one, with pretty and inexpensive devices. She can make a seat or stool from a good-sized box, cover it with pretty chintz and arrange a hinged lid so that the box may contain her knitting-work, basket of balls and cut-out garments rolled up waiting to be made, the weekly mending, and perhaps a favorite book and a poem she has clipped from the paper.

Corner brackets with three or five shelves are also pretty and useful, and easily made of boards, if the good man will devote a little time to their construction. A dollar's worth of lumber, when placed in strong and willing hands, will do wonders towards furnishing a home with pretty and convenient articles. But I would not advise a tiny bracket, frame or toy in every vacant place on the wall.

An American lady once asked an Englishman to explain why English orators, ministers and speakers do not make gestures, and stand so still with their elbows clinging close to their sides. He said, "that in England the walls of the houses were so elaborately decorated with brackets and small things that the men had to learn this deportment; if they made a gesture something would be knocked over and broken."

A few pretty devices are always useful as well as ornamental, but too many little things are cumbersome, and not an evidence of good taste as some suppose.

The woman who delights in cluttering up her rooms with every conceivable pattern of fancy work, and toys, and who can never get enough card-board and zephyr to wear her eyes out over, grows to be a fidgety, unnatural woman, wearing out the freshness of her soul on trifles.

I do not depreciate the profit and usefulness of a reasonable amount of fancy work in decorating our homes, and brightening up shady corners. It is natural for especially children and young people to make and admire fancy articles, and is good discipline for them to construct articles that require time, patience and perseverance, and to make presents of them, but it seems to me older and more mature heads can adorn their homes in a higher sense.

"Home's not merely four square walls,
Though with pictures hung and gilded;
Home is where affection calls,
Filled with shrines the heart has builded;
Home's not merely roof and room,
It needeth something to endear it.

"What is home with none to meet,
None to welcome, none to greet us?
Home is sweet, and only sweet,
Where there's one we love, to meet us."

The art of adorning home in this higher and nobler sense, should be the one most cultivated by the home-keeper—herself the first and chief adornment. A kindly natural welcome from the home-keeper goes to the heart, and, after a pleasant interchange of thought, it seems good to be there. But a stiff greeting and a show of small talk, and superficial manners on the part of the home-keeper, give us a longing for our own firesides, or for a pleasant walk elsewhere.

In some homes the love of order becomes a greater fault than the lack of it, and all womanly kindliness and wisdom are forgotten in the effort to keep the house painfully neat. The visitor who has walked, is made to feel that that the particles of dust unavoidably clinging to his feet are disturbers of his hostess's peace. If little children call, they are bidden to sit on the door-step, lest they might misplace a chair or leave a finger-mark on the door. The better-half of the over-neat housekeeper has a trying time of it. She follows him with mop and dust-pan when he walks in the doors, and slips a mat under his feet when he sits down, and he feels more at ease in any other place in the world than in his own home.

The kindly, gracious home-maker has nothing too good to share with her family and friends. She diffuses warmth and geniality; she encourages the depressed; comforts the sorrowing and guides the erring; her words are the expressions of a true and honest heart, and she accepts the pauses in the conversation as golden opportunities for reflection. She makes her home a sanctuary, from which true friends are loth to depart, and which her family esteem as "the dearest spot on earth." Such is the highest phase of home adornment.

Flowers are a sweet and helpful part of home adornment, but we cannot have them for the wishing. They require a little work and attention. The seeds must be sown aright, and the various wants of the plants attended to while growing. A new beginner is apt to buy high-priced fruit seeds because the descriptions and chromos in the catalogue make them appear very beautiful. It is better to start with a few hardy kinds only, and if successful, the skill gained by experience will enable you to grow plants from the finest greenhouse seeds.

There are many who fail with seeds, by planting them during the warm days of April. There are only a few hardy kinds that succeed if planted before the ground is thoroughly warmed. Sweet peas, phlox drummondii and petunias may be sown early, but the 10th of May is soon enough for most seeds. Those who have a frame or hot-bed, have an advantage. They can have good strong plants ready to transplant to the flower-beds the middle and last of May. Select a place for a seed bed with a south slope, if possible; spade deep and rake smooth, and make a good mellow bed, to insure success; have a load of new soil from the woods — it will not bake after watering, and injure the little seedlings. The seeds should be sown in drills one-fourth of an inch deep, covering large seeds deeper than small ones.

Those unscrupulous destroyers, the chickens, may be kept from the seed and flower beds by a twine fence, or a rustic railing, and other convenient devices. A twine fence is made by driving down a stake in each corner of the bed; tie the end of the twine to one; take the ball and go around, stopping at every stake to wrap the twine around once, and draw tightly. Let the twine run about three inches apart. A rustic railing is made of small round sticks, with the bark left on, and sawed in equal lengths; drive them in the ground three or four inches apart, and weave a limber switch in and out, at the top, two or three inches deep.

A friend once said to me, "If you could not have but one flower, what one would you choose?" I replied, "Do not ask me such a sad question; it suggests a life in a smoky, crowded city, with the pure air and sunlight shut off from a small attic window by high walls. So long as there is one broad acre, and freedom to daylight left me, I will never trouble myself to select *one* plant as the *best* of all. I will give as many of them a chance to grow as I can."

One essential to success in flower raising is to put the plants in a suitable location. Pansies will thrive in our country if sheltered from the sun from 10 o'clock in the morning till 4 in the evening. The north side of the house is a good place to grow them. Verbenas, Petunia, Portulacca, Phlox Drummondii and the Vincas will cheer you on the south if you furnish them with a moist, mellow soil, and make the bed level with the ground. We do not recommend raised borders unless finished with a solid box edging. Carnations, Heliotrope, Feverfew and Geranium will thrive better on the east side. The shade from the afternoon sun is very grateful for them; though with us they are very satisfactory in the open lawn in full sun. They require more watering in this location, and we find the evening the best time to irrigate.

An excellent way to have one good bed is to make a box six feet square, or so much larger as you need, (without a bottom,) and twelve or fourteen inches deep. Stay the corners by binding them with tin or strap-iron, made fast with wrought nails that will clinch. This prevents the warp from opening the corners. Where you wish to set the box, spade up the ground well, make a trench and settle the box eight inches below the surface. This will circumvent moles and gophers. Fill with fresh soil from the timber, or the new soil washed upon overflowed bottom lands. The box should be filled *full*, and the surface kept level. The soil will settle some and leave room for watering. If rain showers are light and long between, this bed should be watered thoroughly. It requires no great labor to keep the soil moist to the bottom, for it holds all the water we give it, while in watering an open border it is liable to run off, and only moisten the top, which always injures the plant. If we water our plants at all during the dry season, we must have them placed so we can water them thoroughly; a little sprinkling of the leaves and moistening the top of the soil is dangerous. The outside of this box can be ornamented to suit the taste of the owner; a row of even-sized boulders, four or five inches through, laid evenly and closely, hides the boards and looks well. The yellow myrtle is excellent for a border; plant it next to the outside of the box, and its graceful vines will form a fringe to cover the top of the boards and meet the boulders. All kinds of bedding plants luxuriate in this box, and the selection and arrangement depend on where we place the box; if we place it against the back fence we will need a foil or back; if we plant white flowers we will enjoy a foil constructed of varieties of Coleus and Acaranthus; if scarlet blooms prevail, a green-and-white back will please us better, and in any case, if the box is against the fence or a tree, a vine trained up so it will not entangle the plants in the box, is very satisfactory. If we put this box in the open lawn, we will need to commence in the center with the tall varieties of foliage plants, with rose Geraniums, Feverfews, Heliotropes, Flowering Geraniums and Carnations, graduate it down to Alyssum, Verbenas, and last of all, Myrtle. If we cannot obtain the plants named, let us plant anything we have in the shape of a flower, and learn by experience what we want in this mammoth bouquet.

Cuttings can be easily started any time from April to October. We prefer the new growth for cuttings, taken just before maturity; nip off the bloom bud. The Tropaeolum and Oleander root in pure water; the Geraniums and Verbenas, Hydrangea and Flowering Begoneas root in a slightly moist and sandy soil; the Fuchsias, Coleus, Abutilon, Justicia and Heliotrope, in a very wet soil — they should be started in shallow pans. During the cool weather of early spring or late fall, bottom heat should be applied. This can be easily done by putting hot bricks or stone covers under them every morning. During midsummer the sun will furnish sufficient heat, but the cuttings should be shaded. For winter blooming, new plants are better than old ones, and cuttings should be started in August and September.

The verbena is not usually regarded as a good winter-blooming plant, but I experimented with them last fall in a way that proved eminently successful. The middle of last September I took up rooted joints from a verbena bed — the last joint next to the bloom — and planted them in quart tin cans, one root to a can. Set them at a cool west window until the middle of November, when I set them in a south window, in a warm room; watered them thoronghly twice a week with soap-suds from the laundry. The first of January they were loaded with bloom buds, and blossomed luxuriantly — eight to ten trusses — for three months. Geraniums, under same treatment, bloomed constantly.

The Buvardia is a good winter bloomer, and easily managed. Plunge the pots in the border in June, and remove to the house in September. The flowering Begonias are satisfactory winter plants; also the Sweet Alyssum; they will thrive best near the stove, in a temperature of seventy-five or eighty degrees. The Primrose, the Fuchsia, Heliotrope and Geraniums are very desirable for winter, and thrive best in a temperature of seventy degrees. For decorating shady corners of the room, the Madeira Vine is the most satisfactory tender vine. German Ivy is good, but requires a much stronger light. For places where a ray of sunshine never comes, I have found nothing better than English Ivy and Wandering Jew.

The objection is sometimes raised, that plants in rooms are injurious to the health of the inmates. I was long since convinced, by experience and observation, that this is not true. The following note, taken from one of our medical journals, confirms my opinion:

> "I think plants could be used as a sort of vitaometer. The value of plants, in a health point of view, is not yet appreciated as it will be. A room where plants do well makes a good living room. The three sources of ill-health of indoor life, in cool weather in particular, are superheated air, too dry air, and air loaded with carbonic acid. Regulate the first condition by good ventilation, the third by growing plants in the room, and the second by a porcelain tray of water under the plant stand, or on the window among the plants. Discriminate only against those plants the odor of which we know to be disagreeable to us. A room with more or less thrifty plants has not only an air of refinement, but literally a purer air than without them."

Those who can give but little time and work to flowers, will find it an advantage to make use of those that take care of themselves in a measure. Of the annual flowers, Balsam, Portulacca, Petunias, Ragged Robins, Salvias, Phlox Drummondii and the native White Primrose seed themselves, and only need to be thinned or transplanted, and to receive some care during their growth. Plants that live and increase from year to year are also desirable, such as the Lilies, Peonies, Yucca, Perennial Phlox and Peas, and the Sweet Williams and Chinese Pinks. These should be protected in winter with boughs or coarse straw. The various flowering shrubs add much to the attraction of a spacious lawn. The Shrub Honeysuckle, Spirea, Flowing Almond, Snowball and Syringa do well in our climate; also the annual and perpetual roses. Among the woody climbers, we can depend upon the Wisteria, Virginia Creeper, the Red and Orange Honeysuckle, Woodbine, and the Climbing Roses.

I must not omit to mention the Zinnia. I do not know of any annual that better repays good culture. It is the Dahlia for the West. The seeds germinate readily, and it adapts itself to our climate perfectly. Care should be taken to get the best of seed.

> "Happy is he who in a country life,
> Shuns more perplexing toil and jarring strife—
> Who lives upon the natural soil he loves,
> And sits beneath his old ancestral groves."

It sometimes makes us sad when we remember that we cannot "sit beneath our ancestral groves," and breathe the sweet odors of our mother's "garden of roses and sweet pinks and balms" and view the old "meadows with buttercups gay." But, if we cannot live in the scenes of our childhood, we can love the trees of our own planting, and with our friends and children enjoy their shade.

The injunction "Plant trees," which has gone forth from this Society, has been heeded by many, although the work is but cleverly commenced. The experience of the past twenty years has taught us some of the best varieties to plant, and best mode of culture; and a relation of the results from time to time would be valuable to many who are desirous to learn what trees to plant and how to plant them. We have so many beautiful native trees, that for timber and shade few foreign ones need be sought for. Let each one exercise his own taste in selecting from the list adapted to this climate. All we want to say is, plant trees and seeds of trees; plant as many as you can; let them shelter our homes from the heat and dust of the highway.

We have a friend who loves the evergreens; the lofty ancient pines wave around his cozy home, and they inspire him with hope. Another, not so retiring in his taste, loves the forest trees better. When the frost takes the foliage he is left without a screen, and he says he can "see out." Another wants all the sun on every side, and plants his trees several rods away. By different tastes we get different scenery; but the owner of a house and lands who allows it to stand year after year without trees, makes a barren piece of scenery that offends the eye of every one, and we cannot think he does it from choice, for he is in a civilized country. Now let all who have barren lands plant trees. They will make your property and homes beautiful, and help to make our country beautiful. We need green lawns and trees and flowers, as well as potato patches and vineyards.

The refining influence of a beautiful forest tree in the narrow yard or cramped location of the humble farmer is as great as it is in the spacious grounds of the millionaire. Nothing that tends to make the children love the home and to make the family happy, should be neglected. The importance of mutual improvement cannot be over-estimated. It is through the parents and teachers that we must look for the source, the real home adornment we are striving to reach. The teachers of thirty years ago never thought of instructing their scholars in the harmony of beauty, the necessity of adorning their homes, yards and play-grounds with nature's beauty and the happy influence of beautiful surroundings.

We can investigate the needs of the present age, and look back at the past when we were growing up, and find that we were not instructed to meet the demand. The weak will faint by the wayside, and the strong will learn for themselves in mid-life what they should have learned when children, in their school days; but let the strong encourage and help the weak, and a good work will be the result, and the children of to-day will be able to commence where we leave off, and the influence of adorned nature will be the rule instead of the exception.

Let us spare no effort to make our homes attractive and beautiful; surround them with green carpets and waving trees and brilliant bloom; put flowers upon our tables and adorn our rooms with pretty devices, remembering that—

"Home is the sphere of harmony and peace,
The spot where angels find a resting place,
When bearing blessings, they descend to earth.

Nor need we power or splendor;
Wide halls or lordly dome;
The good, the true and tender—
These form the wealth of home."

The President appointed a committee, consisting of Messrs. Griesa, Barnes, and Reed, to examine the fruits on the premises, and report; but the membert of this committee were so attracted by the picnic dinner and so captivated by the exercises, that they could not leave the grove. The Secretary, being well acquainted with the premises, will come to the rescue. Mr. Savage has over twenty-five acres in bearing apple orchards, all in excellent condition, from which he will gather from 2,000 to 3,000 bushels the present year. Besides these he has plantations of all the other kinds of fruits usually grown in Kansas. For the last twelve years he has made a business of horticulture, and now the harvest is ripening and the reward is at hand.

After a vote of thanks to Prof. Patrick, and Mr. and Mrs. Savage, the meeting adjourned.

MEETING HELD JULY 24, 1880.

The July meeting, held at the residence of Mr. W. E. Barnes, Vinland, was not only largely attended, but was one of much interest and encouragement to the fruit growers of the county.

ORCHARDS.

After the usual preliminary exercises, the condition of orchards throughout the county was inquired into. Verbal reports were made by Rev. C. H. Lovejoy, Thomas M. Pierson, Wm. H. Gill and others, all indicating an unusually full crop of nearly all varieties of apples, peaches, and pears. Mr. Lovejoy estimates his apple crop at 2,000 bushels, besides a full crop of pears. In fact, the yield of apples in this county the present year will incomparably exceed the crop of any previous year.

PROSPECTS OF FRUIT IN ADJOINING COUNTIES.

MR. S. W. PEARSON, chairman of Committee on Orchards, having recently traveled through the counties south of Douglas, informed the meeting, through the Secretary, that all through this county the apple crop will be very large, as also of pears and peaches. After leaving Douglas and passing into Franklin, he found the crop had diminished to one-half, which he found to consist chiefly of Rawles Genet, Winesap, and Missouri Pippin. In Anderson county he found not more than one-fourth of a crop. In Allen county he found many peaches, but very few apples. In his travels he noticed that young orchards were usually looking healthy, and appeared free from the depredations of the borer.

ENTOMOLOGY.

MISS M. L. MACY gave a remedy for the extirpation of the black aphis, which is carbolic acid mixed with soft soap — two or three tablespoonfuls of the acid to a quart of soap — applying the same with a sponge or syringe. This compound is harmless to plants, but fatal to insect life, and may be used on delicate flowers without injury.

FRUIT ON THE PREMISES.

A committee, consisting of A. Griesa, Wm. Roe and Wm. Miller, was appointed to examine the fruit on the premises, and report. After spending some time in looking over the grounds, the committee reported:

We, the undersigned committee, find the apple orchards in fine condition, bearing immense loads of fruit, with no apparent disease.

First in order of productiveness are the Missouri Pippin, Ben Davis, Winesap, and White Winter Pearmain. Of fall apples, the Rambo, Jonathan and Rome Beauty are all well fruited. Among the early varieties, the Early Harvest, Carolina Red June and Duchess of Oldenburgh are full crops.

William's Favorite, an apple of good size and color, is a great favorite with Mr. Barnes. Cooper's Early White is also bearing full.

In pears, we saw trees in good condition; no blight; full crops. Leading varieties, Bartlett, Flemish Beauty, Howell, and Seckel; dwarfs, Louise Bonne de Jersey, Duchesse d'Angouleme, Kirtland, and Buerre d'Anjou.

We find the vineyards in good health; no rot, and no cultivation this year, the grounds having been mowed.

Mr. Barnes considers non-cultivation a preventive of rot.

SMALL FRUITS.

Mr. Underwood recommends the Gregg as being one of the very best raspberries for shipping purposes. It is both a firm berry and a good bearer.

Mr. Lothrop reported the borer injuring his raspberry canes, and inquired for a remedy. The only one given was to cut off the infected canes and burn them.

CURRANTS.

Will currants succeed in Kansas? It was the expressed opinion of several that they will, if kept well mulched, and planted on the north side of a fence. The shade, however, must not be a living one, such as hedges or trees afford.

MARKETING FRUIT.

Fruit of all kinds for shipping should be picked before it is quite ripe. If it is allowed to fully ripen, and is shipped any great distance, it will arrive in bad condition and sometimes prove worthless. Blackberries should be picked before the red has quite left them; and peaches and apples should be picked while firm, as they will ripen during transportation. Mr. Underwood said the cause of so many blackberries getting to market in bad condition this season was that they were not picked often enough. To have them firm and suitable for shipping any distance, they should be picked every day.

After a vote of thanks to Mrs. and Mrs. Barnes for the hospitable entertainment, the meeting adjourned.

MEETING HELD AUGUST 21, 1880.

The regular monthly meeting of the Society was held, pursuant to call, at the residence of Mr. Fitch Reed, one of our most enterprising and thrifty farmers. Mr. Reed is not one of the "old settlers," having lived in Kansas but eleven years. His orchards are therefore too young to yield large quantities of fruit; but they are well taken care of, and in fine condition. The meeting was held in his new and capacious barn, which is a perfect model in all its arrangements and conveniences.

As the members were late in arriving, no business was transacted until after dinner.

BUSINESS.

President Watt called the meeting to order, and the minutes of the last meeting were read and approved.

The Secretary then read a communication from the Secretary of the Johnson County Horticultural Society, asking for a joint meeting of the two societies in September, to be held somewhere near the line of the two counties. After a full discussion, it was decided to hold the next meeting conjointly with that society, at the residence of Mr. Barclay Thomas, near Hesper, on the fourth Saturday in September, being one week after the close of the Western National Fair.

ORCHARDS.

Apples were reported to have suffered badly from the late excessive hot and dry weather, by prematurely ripening and dropping. It is noticeable, however, that where orchards have been plowed, cultivated and taken good care of, the fruit is not only better, but is much less liable to leave the tree before ripening. Orchardists should bear this fact in mind, and profit by it in the future.

Mr. S. W. Pearson, in his peregrinations through the counties south and southwest of Douglas, noticed that the early varieties of peaches, such as the Hale's Early, Alexander and Amsden, were bearing full, while the blossoms of the later varieties had all been killed, and asked for a solution.

W. L. Fitch, a new member, replied that just as the bloom is falling, the germ is in the tenderest stage, and is easily killed. The late varieties must have been just in that stage when the freezing came, while the early varieties must have passed it, and escaped.

HANDLING AND MARKETING FRUIT.

Mr. Watt says the growers of this county are not careful enough in assorting and handling fruit. The Colorado market requires, and will pay a good price for, good fruit, while poor fruit often brings the shipper in arrears for freight or express charges. The greatest drawback to marketing fruit he finds to be the high rates of freight and express charges. Some time since he shipped twenty-three bushels of apples, by freight, to Denver, and the charges on the same were $22. Grapes are sold at two cents per pound in Lawrence, and the Kansas Pacific Company charges three cents per pound to carry them to Denver. This would be $600 for a car-load of ten tons. This railroad monopoly is robbing the producer and ruining the country.

At this stage of the meeting three committees were appointed, one consisting of Messrs. Stanley, Kelley and Gilson, to examine the orchards on the place, etc., and report; another, consisting of Messrs. Savage, Pearson and McClintock, to examine the fruit on exhibition; and still another, consisting of Messrs. Reed and Gilson, to examine a drier on exhibition.

MUSIC.

While the committees were preparing their reports, the singers present favored the meeting with several good selections of music.

REPORTS OF COMMITTEES.

The committee on fruit on exhibition reported as follows:

Your committee on fruits on the table beg leave to report: We find a large collection of grapes of fine quality, also apples and pears, as follows:

Mr. Ayer—Apples: Northern Spy, Maiden's Blush, Jonathan, Vandevere Pippin, Buckingham, Pumpkin Sweet, and one fine seedling. Grapes: Concord, Delaware, Ives, Iona, Diana, Dracut Amber, Catawba, Lindley, Eumelan, and Merrimac. Pears: Duchesse, Bartlett, Louise Bonne de Jersey, Beurre Diel, Howell, and a seedling of good quality and medium size.

Mr. Griesa—Grapes: Wilder, Goethe, Lindley, Agawam, Delaware, Elvira, and Concord. Peaches: A nice seedling of fair size and excellent quality.

Mr. McCandless—Grapes: Delaware, Martha, Diana, Lindley, Allen's Hybrid, Wilder, and Catawba. Apples: Nice specimens of Porter.

Mrs. Burlingame—Apples: Pumpkin Sweet and Cooper's Early White.

J. P. Foster—Apples: A variety without a name.

Mr. Reed—Apples: Mammoth Pippin and St. Lawrence.

We would particularly refer to the Lindley grape for large size and good quality; and the Delaware, which are in extra-fine condition; also the pears —fine, smooth, and perfect.

Respectfully,

Seth W. Pearson,
Wm. C. McClintock,
Committee.

The committee to examine the premises reported:

The orchard is in splendid condition. White Winter Pearmain—Trees young; not bearing full, but very nice and large. Rawles Genet—A light crop, but large for the kind. Jonathan—Very nice specimens. Willow Twig, Winesap—Bearing well. Missouri Pippin—Loaded down with apples.

SMALL FRUIT.

Complaint was made of rust on the blackberry cane, supposed to be caused by the continued hot, dry weather. The canes never recover after the attack, and should be removed.

Mr. Lothrop recommends that raspberries be kept in hills and plowed both ways, as they require so much cultivation.

ENTOMOLOGY.

A. Griesa reported the round-headed borer decreasing. It is being destroyed by the parasites. The martin has destroyed the tent-caterpillar. We see no more of that insect here; and we may reasonably hope that the "round-head" will soon be *non est.*

EX-PRESIDENT SEDGWICK

Being present, was called upon for a speech. He responded with one of his humorous effusions.

It was thought by some, he said, that he had been too severe on woman's style of gardening in his address at the June meeting. He had made up his mind to retract, but on reading the Bible recently, he discovered that woman raised *Cain* in the garden of Eden. He has observed that some women keep right on raising *cane*. He considers the latter variety the more dangerous, because it is often raised right over a man's head. So, after seeing and feeling what he has of the effects of this cane-raising, he cannot record any apology.

He visited Mr. Joseph Savage's orchard in June, and found them looking well, but full of hogs. He thought Mr. S. a hoggish fellow, until he invited him to supper, and then he changed his mind.

He referred to the favorable report he made on Mr. Coleman's orchard last spring, which was done to the best of his judgment. He says the report at the Coleman meeting in May was a "stay of proceedings issued, a mandamus sworn out, an injunction served, a change of venue granted, an appeal taken, and a judgment rendered which knocked his judgment into a cocked hat."

MR. AND MRS. REED

Were indefatigable in their efforts to make the meeting a pleasant one, for which they received a formal vote of thanks from the Society.

MEETING HELD SEPTEMBER 25, 1880.

The horticultural friends gathered together in the beautiful little grove of Barclay Thomas, two miles south of Hesper. It being a joint meeting of this and the Johnson county society, several from that county were present, but not as many as was hoped, or probably would have been, on account of the threatening clouds of the morning. However, where two or more horticulturists are gathered together, they always have a good time, and so it proved It being quite a distance for most of the members to go, and getting together late, no meeting was held before dinner. The good things were brought in in abundance, and the long table, spread beneath the green boughs, groaned with its load.

Our President and Secretary both being absent, Mr. Joseph Savage was elected President, and Miss M. L. Macy Secretary *pro tem.*

The following committees were appointed by the chair:

Committee on Orchard and Grounds—Mr. Burlingame, of Lawrence; Mr. Gill, of Vinland; and Mr. Hubbard, of Olathe.

Committee on Fruits—Mr. McFarland, of Johnson county; Mr. Ayer, of Lawrence; Mr. Henshaw, of Hesper.

The subject of orchards was then taken up.

Mr. McFarland, of Johnson: Fruit in our county is of good size, and abundance of it; falling badly, on account of continued dry weather; much going to waste for want of a good market and better prices; many are thinking some of shipping west.

NATHAN HADLEY, Hendricks county, Ind.: Had visited the orchard that morning, and was compelled to admit that it was the nicest one he ever saw; didn't like to admit it, but must.

NEWTON HENSHAW reported his trees bearing well only on the north and northwest side of them. Asked an explanation.

MR. THOMAS: My trees bearing well on all sides; Missouri Pippin loaded to the ground.

MR. BURLINGAME: Trees bear better on north side, owing to hard south winds.

MR. GILL: During frosty weather the north side of trees are protected from the sun, thaw out slowly, and are not so easily injured by frosts.

MR. SAVAGE concurred in Mr. Gill's opinion.

MR. GILL: How are we going to save our prematurely-ripened fruit?

MR. SAVAGE: Barrel up tight, and open only as used.

MR. GILL wanted to learn how to bury apples in the ground.

MR. MCFARLAND: Smooth off the ground and cover one foot deep with straw, pile up fruit, cover with another layer of straw, one of dirt, another of straw, and cover the outside with dirt.

MR. GILL: Have tried holing up in boxes; kept well, but rotted very quick on being opened.

MR. SAVAGE had similar experience.

MR. SAVAGE: This is a remarkable year for apples to be free from scab; apples so early ripened will not keep well.

MR. THOMAS wants to know how to make gooseberries bear.

MR. SAVAGE! Cut one half of the canes down to the ground, let new canes form — new shoots will bear — then cut the other half down.

MR. STUBBS: I never fail to have gooseberries; my bushes are on the north side of the orchard.

MR. SAVAGE had noticed the soil in coming down Lawrence. All from Blue Mound to Hesper is the sandstone formation — the best of soil for fruit, especially peaches. Wherever we see this sandstone soil the streams are full of water. Limestone soil is too dry for fruit. Plant late budded peaches — they bring the best price. They ripen just as the main crop is about gone.

REPORT OF COMMITTEE ON TABLE FRUIT.

Your committee on table fruit beg leave to omit nomenclature, on account of so much fruit and so limited a time for examination, and give name of exhibitor, kinds of fruit, and number of varieties:

Dr. Hubbard, apples, four varieties; L. McFarland, apples, four varieties; Newton Henshaw, apples, twelve varieties; Stephen Stubbs, apples, twenty varieties, and four of peaches; B. Thomas, apples, fourteen varieties, pears, twelve, and peaches, one; J. P. Kendall, apples, twenty-one varieties, peaches, one, pears, one; H. Stanley, apples, nine varieties, peaches, one; M. L. Macy, apples, six varieties; Joel Charles, apples, one variety, peaches, three; S. Kersey, peaches, one variety (a seedling very large and fine); W. Kohler, peaches, one variety.

L. McFARLAND,
OMAR H. AYER,
N. HENSHAW,
Committee.

On motion, a hearty vote of thanks was tendered Mr. and Mrs. Thomas for their kind and generous hospitality extended to the Society during its meeting.

MEETING HELD OCTOBER 16, 1880.

The October meeting was held in the University. To occupy those pleasant rooms again, after the many peregrinations through the county, seemed like returning home from a long summer's journey. The very clean and fresh appearance of everything in and around the University is quite refreshing to the senses; and the many specimens and curiosities in natural history and the sciences furnish the mind with unlimited food for reflection. The place, with its literary and scientific associations, is certainly a wonderful auxiliary to the Society, in its investigations into those subjects connected, directly or indirectly, with horticulture; and the privilege of holding its winter meetings there is duly appreciated by all.

The President being absent, E. A. Coleman was elected President *pro tem.*, and the minutes of the last meeting were read by Secretary Savage; after which the subject of orchards was discussed.

DR. MARVIN favored the meeting with some practical remarks on this subject, taking the position that if the horticulturists of Kansas expect to realize great success, they must introduce and propagate fruits adapted to the peculiarities of the Kansas climate, which can only be done by diligent and practical experiment. For instance, the Greening may be number one in New York and in Kansas almost worthless. One variety may, in the Eastern or Middle States, prove itself a good keeper, maturing and mellowing in the cellar, while in Kansas the same variety may ripen and mellow upon the trees, thereby losing all its keeping properties.

As most of the horticulturists of Kansas grow fruit for market, large size and good looks should also be taken into account. We should start new varieties, either by seedlings or fertilization, or both, and if they had merit they would be received West and South, even if rejected East. Then we must learn how to defend our fruit against insects. In order to do this, it is not necessary to traverse the whole field of entomology. We must concentrate our thoughts on the study of the unfriendly insects found in our own orchards. The borer, the codling moth and the tree cricket are the principal enemies we have to fight, and the sooner we learn to exterminate them the better.

MR. G. Y. JOHNSON is fearful that the late warm weather will not only injure the prospect for next year's crop of fruit, but prove damaging to the trees themselves. However, this may depend upon the character of our subsequent fall weather. He estimates that not less than one-fourth of the apple crop is rotting, being the result of both the depredations of insects and the recent excessive warm weather. He referred to a seedling that could not be distinguished from the Spitzenberg. If we could propagate a Kansas apple that possessed the size of the Missouri Pippin, the fruitfulness of the Genet and the fine quality of Grimes's Golden, we should have an apple much nearer perfection than we have at present. We have 7,000 school children in this county, who ought to study entomology. The subject must be brought into the common schools.

MR. DEMING said that before the late rain his Genets were sound on the tree, but they immediately cracked open after the rainfall.

MR. AYER has but few apples, and they are rotting badly. The Rambo is liable to crack after much rain.

MR. COLEMAN stated that Oliver Barber has produced the Rhode Island Greening in as fine condition as any found in New York. Much depends upon location.

MR. SMITH, of North Lawrence, has been more successful with the Greening than with either the Ben Davis or Genet.

MR. COLEMAN, to illustrate a point that Dr. Marvin made, viz., that we must grow apples that will sell well, held up three apples, saying that last year he saw three loads of apples drive up to Keeting's store containing the three kinds he held in his hand. The first was a load of Genets, for which he was offered 52 cents; the second load was Missouri Pippins, for which 70 cents was offered; and the third Ben Davis, for which 75 cents was offered. Now every one knows that the Genet is much the best apple of the three, in all respects except in looks, while the Ben Davis is the poorest in quality. As long as people *will* buy apples with their *eyes* instead of their taste, we must endeavor to please them.

ENTOMOLOGY.

MR. DEMING exhibited a specimen of a tree cricket. This insect has done much damage to the apple crop the present season by puncturing the fruit, causing it to rot. It deposits its eggs in the limbs of apple and other trees. The only mode of destruction now known is, to cut off the limb or twig containing the eggs, and burn it. He also exhibited what he supposed to be a beetle of the peach borer, but it was not clearly identified.

METEOROLOGY.

PROF. SNOW furnished the Society with a synopsis of the mean temperature of the weather of the first half of October, for the last ten years. In 1869 the average temperature was 49 degrees, while in 1879 it was 71.84, making a difference of nearly 22 degrees. Such an unprecedented high temperature for October must have a marked influence upon vegetation.

It was stated by several persons that trees were still growing, and the bark of the peach tree slipped as readily now as it usually did on the first of August.

The rainfall for the year thus far has been six inches below the average.

The Old Settlers' Band furnished several pieces of fine music, among which was a bass solo, by Samuel Reynolds, from the Oratorio of *Judas Maccabeus*, with full orchestral accompaniment.

Miss M. L. Macy was called upon for a literary production, and favored the meeting with the following

ESSAY.

"With what a glory comes and goes the year!
The buds of spring, those beautiful harbingers
Of sunny skies and cloudless times, enjoy
Life's newness and earth's garniture spread out;
And when the silver habit of the clouds
Comes down upon the autumn sun, and, with
A sober gladness, the old year takes up
His bright inheritance of golden fruits,
A pomp and pageant fill the splendid scene—
There is a beautiful spirit breathing now
Its mellowed richness on the clustered trees,
And from a beaker full of richest dyes,
Pouring new glory on the autumn woods,
And dipping in warm light the pillowed clouds.
Oh! what a glory doth this world put on
For him who, with a fervent heart, goes forth,
Under the bright and glorious sky, and looks
On duties well performed, and days well spent;
For him the winds, aye, and the yellow leaves,
Shall have a voice, and give him eloquent teachings."

Like a tired child after a day's ramble in the woods, which has long been looked forward to, longed for, who is glad to get home to his mother's at night, so we, after a summer's ramble here and there, are glad to be housed once more within these friendly walls. But now the question comes home to us, what have we gathered in those pleasant rambles here and there of value to ourselves and others? Have we brought home that which will furnish mental food which will be strengthening and grateful during the months of our stay here again? If so, what is it? Our minds and tastes are varied, and would gather and grasp a variety. So let us now as one family spread a mental table, and all bring what has been gathered.

So, the first that I will bring will be one which will be too heavy for me to carry alone. When I think of those grand views which come upon us here and there, at every turn in this county, my pencil involuntarily stops, and I drink in again the beauties of a Douglas county landscape. But I cannot dwell long upon that enchanted scene, for through it comes one which makes us feel as if some one had asked, while I was wrapped in profound contemplation of the natural beauties, if we would "take some peanuts?"

We don't consider that it takes, essentially, an elegant mansion and extensive lawns to make a beautiful home, nor does it consist in one without the other. But when blue-grass and hedges are so easily grown and within the reach of all, we ask again and again, "Why don't they have a *home?*" Make neat and tidy the house you have. If you are not able yet to build a better one, grow a hedge around it and cover your yard with *grass.* Sometimes my mental occupation is the distribution of neat country villas and their yards of *green.* Everywhere we see, seemingly, the labor of art anticipated by nature. If I had but the power of dotting this country, by the wave of a wand, with home surroundings as they should and could be, what an elysium we should have! When we look back and think of the smooth green carpet, studded with flowers, which once spread out a revelation of God's love as the bright stars above, we involuntarily exclaim, "Oh, what a desecration!" and we look off on the far-away spread of some yet grassy plain, and think of how that abounds in capabilities, and wonder if they will add to nature the works of art, or spoil her handiwork. When we see with what ease and little expense some people make more beautiful these grand old hills and vales, we ask ourselves the question: Is there no way by which every one can be made to feel of that which is homelike and beautiful in his surroundings? Can't we devise some means by which we can reach this class of our community?—and certainly if anything can be done, now is the time to commence. In the winter the farmer has the most leisure to clear up his farm and look around, and see what is needed to be done to shape things up for the spring.

We have all the natural facilities requisite to make this county one of the most beautiful in all our Nation, and I believe it can be done if only thought and energy are put to work. It is not a work to be accomplished in one winter, but the gradual growth of years. Then let us labor to make our county "a thing of beauty and a joy forever," that those who hear of it will come and see for themselves, and when gone again, say that "the half had not been told."

FRUIT ON THE TABLE.

A very handsome display of fruit was made, as follows:

By E. A. Coleman—Missouri Pippin, Willow Twig, Grimes's Golden, Ben Davis, Rome Beauty, White Winter Pearmain, Winesap, Nonsuch, Sweet Romanite, Fameuse, Lawver, Fall Winesap, White Pippin, Roman Stem.

By Joseph Savage—Stark, Wine, Missouri Pippin, Willow Twig.

Mr. Coleman also exhibited a branch cut from a beautiful ornamental tree, which has blossomed and seeded the present year for the first time. Its age is seventeen years, and its indigenous home, Japan. The foliage and seed-pods are most beautiful, and entirely different from anything ever before brought to the notice of the Society. He calls it Sophora Japonicus.

At an early hour the meeting adjourned.

MEETING HELD NOVEMBER 20, 1880.

The meeting of the Society at the University last Saturday was not only interesting from a social standpoint, but was characterized by much practical discussion on the relative merits and demerits of the different varieties of apples most commonly found in our Kansas orchards. It is a fact well known by all our orchardists, that a very large majority of all the varieties grown in the country are unprofitable, and therefore unworthy of propagation. Out of the one hundred varieties grown here, not more than a dozen can lay claims to real merit. If those who now own large orchards had possessed the knowledge of the suitable and unsuitable varieties to our soil and climate they now possess, through the past twenty-five years of experience, the list would have been cut down to less than twenty varieties, while the income derived would have been more than quadrupled. The benefits of this experience should be appreciated and appropriated by all who plant orchards in the future. Among the varieties found most successful and profitable are the Red Astrachan, Early Harvest, and Carolina Red June for summer; the Maiden's Blush and Jonathan for autumn; and Winesap, Rawles Genet, Ben Davis and Missouri Pippin for winter.

ORCHARDS.

On the suggestion of Joseph Savage, the members were requested to give their present year's experience with the different varieties of apples.

Mr. T. M. Pierson, being one of the oldest and most successful orchardists in the county, was first called up. Fortunately, the largest portion of his orchard consists of Winesap, which have borne full this year, the fruit being of large size and excellent quality. The White Winter Pearmain came next in productiveness, while the Rawles Genet bore a light and inferior crop. The tree cricket worked badly on the Genet and Willow Twig, while the Missouri Pippin, for want of better flavor, entirely escaped. The Gilpin did well, as also the Baldwin and Grimes's Golden. The latter he classes with the fall varieties.

Mr. Coleman spoke favorably of the Baldwin, and would advise every young orchardist to plant at least one row of this variety. It bears full alternate years, has firm flesh, tough skin, and is a rich apple, the only drawback being its lateness in coming into bearing. He also strongly recommended Grimes's Golden, which bears profusely every year. If it is gathered early in the fall, and taken proper care of, it may be kept till spring. The Rome Beauty drops badly, which detracts much from its value.

Mr. O. H. Ayer planted the Baldwin eight years ago, from which he gathered a nice crop the past season. His Rome Beauty suffered from blight, and the Rambo was badly injured by the tree cricket. White Pippin bore well, and the tree is very thrifty.

Mr. Brackett, being called upon, said the only benefit in having so many varieties was, to suit family and individual tastes. As for the Baldwin, it is quite unprofitable, and could not get one vote in its favor out of sixty of our principal horticulturists in the State. He hoped this Society would not recommend it for profit. The question which concerns us most is, What shall we plant that will pay best? It appears that the Winesap and Rawles Genet approach nearer to our idea than any and all others, but they have their defects. The Winesap ripens too early and the Genet too late, and the fruit is too small. What we want is a full, medium-sized apple, red in color, rich in quality, firm in texture, maturing late in October, and possessing the best of keeping properties. Such is the coming apple. Mr. Brackett considers the Winesap, Ben Davis and Rawles Genet the most profitable winter varieties now grown. In considering the tree cricket, Mr. Brackett stated that its depredations in his orchards had decreased for the last four years. The present year it had damaged his fruit but very little, if any. He assigns the cause of this immunity to the large number of blackbirds that domicile on his premises.

MR. JOSEPH SAVAGE thinks there will be more money made out of this year's experience than we can estimate. He grew quite earnest and eloquent in praise of the Missouri Pippin, and believes, if it is not the *coming apple*, it excels for profit all other known varieties. He had the good fortune to plant, several years ago, some five hundred trees of this variety, and this season they all bore full, even down to the three-year olds. He stated that the Secretary of this Society, in looking through his orchards last spring, estimated his crop at 3,000 bushels, and that estimate was about correct, as his bank account would testify.

DR. MARVIN, according to announcement, delivered an address on "The Physical and Moral Effects of Horticulture on Mankind." *

For this excellent address the Society passed a hearty vote of thanks.

HON. T. D. THACHER, being present, was called upon for remarks. He was in sympathy with the Society, and fully appreciated the good work it was doing, and regretted that his business was such that he could not attend the meetings. He had enjoyed listening to Dr. Marvin's excellent address, and was in full sympathy with every sentiment expressed; yet he considered the paramount question for this Society to solve is, how to produce that which will benefit the consumer most, and at the same time pay the best. Of late he has traveled extensively over the State, and was struck with the marvelous production of fruit in its eastern and southeastern portions. This industry is destined to increase to wonderful growth.

DELEGATES.

The election of delegates to the State meeting then took place, which resulted in the choice of D. G. Watt, E. A. Coleman, O. H. Ayer and S. Reynolds. On motion, several others were afterwards added to this delegation.

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* This lecture forms a part of the one found on pp. 82-89, under the head of "The Physiological and Psychological Mission of Horticulture."

MEETING HELD DECEMBER 18, 1880.

The annual meeting of the Society was held at the University, on Saturday, December 18th.

In consequence of so many of our horticulturists having attended the three-days annual meeting of the State Horticultural Society at Wyandotte, and only just returned from the same, the attendance was not large and the exercises confined mostly to executive business.

After the renewal of membership, the election of officers for the ensuing year took place, which resulted in the choice of D. G. Watt for President, S. W. Pearson for Vice President, Samuel Reynolds for Secretary, and O. H. Ayer for Treasurer. The President held the appointing of the standing committees in abeyance till the next meeting, in order that the several positions might be filled with the most suitable persons.

A committee on programme of "special subjects" for the ensuing year was appointed, consisting of M. L. Macy, S. W. Pearson and B. F. Smith.

The Chairman of the Committee on Orchards, S. W. Pearson, reported as follows:

The condition of orchards the past year has been good, and the crop unprecedented. The foremost orchardists of the county are extending more care and attention to their trees. The borers have not been so abundant the past year, which is to be attributed largely to the extra care given in the extermination of these pests. The fruit buds in most varieties give a hopeful outlook for another good crop of apples, although the last was so very abundant.

ELK COUNTY HORTICULTURAL SOCIETY.

(Organized February 6, 1880.)

Officers for 1881:

President—I. W. Mitchell, Howard City.
Vice President—J. A. Somerby, Howard City.
Secretary—D. Newby, Howard City.
Treasurer—P. M. Akers, Howard City.

The above officers, together with A. Crismas and D. C. Harkness of Howard City, Henry Welty of Elk Falls, and M. H. Porter of Western Park, form a Board of Directors.

Interesting meetings were held during the year, the proceedings of which were disseminated, and have aroused quite an interest among the people, on horticultural topics. This Society has had only one year's existence, and as yet the attendance is small, but with proper attention, we have faith will increase in strength and usefulness.

FRANKLIN COUNTY HORTICULTURAL SOCIETY.

(Organized February 3, 1877.)

REPORTED BY THE SECRETARY.

Officers for 1881:
President—A. Willis, Ottawa.
Vice President—C. C. Cutter, Rautoul.
Secretary and Treasurer—W. J. Newton, Ottawa.
Executive Committee—H. L. Coe, Dr. I. Pile and N. M. Chandler, Ottawa.
Entomologist—W. J. Newton, Ottawa.

Meetings are held monthly, and during the summer, in different parts of the county; are largely attended, and a great interest manifested in the discussions. Prospects for the success of the Society the coming year are very encouraging.

GRANT TOWNSHIP (SEDGWICK CO.) HORTICULTURAL SOCIETY.

(Organized April 3, 1880.)

REPORTED BY THE EX-SECRETARY.

Officers for 1881:
President—N. H. Deming, Sunny Dale.
Vice President—A. J. Weaver, Sunny Dale.
Secretary—S. L. Raymond, Sunny Dale.
Treasurer—R. L. Keagy, Sunny Dale.

Meetings are held on the first Saturday in each month. The attendance is constant, and the Society is performing a good work.

JACKSON COUNTY HORTICULTURAL SOCIETY.

REPORTED BY THE SECRETARY.

Officers for 1881:
President—J. W. Williams, Cope.
Vice President—J. Hixon, Holton.
Secretary and Treasurer—Dr. V. V. Adamson, Holton.

The following proceedings are furnished for publication:

ANNUAL MEETING.

The annual meeting was held at the court house, in Holton, May 6th, at 2 P. M., President J. W. Williams, of Cope, presiding.

Minutes of the last meeting read and approved.

Mr. Watkins, of Whiting, moved that the Society proceed to the election of officers for the ensuing year. Carried, and resulted in the election of J. W. Williams, President; Jacob Hixon, Vice President; V. V. Adamson, Secretary and Treasurer.

On motion of Mr. Hixon, V. V. Adamson was elected delegate to attend the meeting (semi-annual) of the State Horticultural Society, to be held at Hutchinson on the 1st, 2d and 3d days of June next.

On motion, it was decided that this Society act in conjunction with the Jackson County Agricultural and Mechanical Association, in making up a display of the products of Jackson county for the Bismarck Fair, to be held September next.

President called for reports as to the condition of orchards throughout the county.

Mr. Evans, of Whiting township, reported apple, peach and cherry trees as promising an abundant yield of fruit. Orchard is located on a high prairie, and well surrounded by trees; is eight years old.

Mr. Frost, of Whiting, has an orchard located on high ground, that slightly inclines to the west; is not protected by wind-breaks of any kind. This orchard is but eight years old, yet everything is full of bloom.

Mr. Sweet, of North Cedar, stated that his orchard was too young to fruit; yet he wished to say to the members of the Society, that in the spring of 1878 he set out 400 apple trees, and to-day 392 were living and doing well, showing a loss of but eight trees. His success with evergreens has not been so good. In the spring of 1879 he set out 76 Norway spruce. They all started well and promised fair, but when the dry weather came on they began to die. He mulched with hog manure; but they continued to die, until, at the present time, there are but 20 living. A neighbor of his set out the same variety of evergreens at the same time; but mulched the trees with a plentiful supply of stone, and saved every tree. Mr. S. also reported his Wilson's Early blackberry as having been badly winter-killed. The Lawton was damaged, but not to so great an extent.

John Black stated that he had examined Mr. Dayton's orchard, and found that some of his early varieties of apples were dropping the fruit, while other trees were full. Fall and winter varieties were all very full. Has a blackberry, thought to be the Little Giant, that promises an extraordinary yield.

A. J. Turner, of Bill's creek, said that his orchard was located on rather low ground; that the first frost, some two weeks since, injured the early fruit; that on the night of the second frost, he kindled fires in his orchard and kept up a smoke all night, thereby saving the rest of his fruit. He has been grafting pears upon the apple, and finds that they do better than when on their own stock—are not so subject to blight; they also have a finer flavor. He has also grafted some upon the black walnut, and up to the present they are doing well. Last spring he cleared up some timber land, and put out 200 apple trees, 199 of which are living, the one that died being affected with the blight when set out; thinks the soil of timber land better adapted to fruit culture than prairie.

MR. REYNOLDS, of Whiting, has been examining a number of orchards in his vicinity. All orchards on low ground have been injured more or less by the frost, while those on high ground are uninjured; the peach should always have an elevated position, with a northern exposure. Then by mulching the trees with old hay while the ground is well frozen, we will be sure of a crop of that most luscious fruit.

R. M. KENNEDY reported his cherries killed by the frost, yet his trees are on the high prairie.

BEN. HAFER stated that the frosts had damaged his apple crop, yet his pears were all right. The apple and pear are in the same location.

J. W. WILLIAMS, of Cope, reports apples promising a full crop; thinks the trees will be too full. Pears setting a fair crop; peaches very full, excepting the budded varieties, which will only have a partial crop; cherries make a fine showing; plums setting a light crop; small fruits of all kinds promising a fine yield. The orchard is on high prairie. Trees and vines of all kinds are in fine condition.

The subject of strawberry culture was introduced, which brought out an animated discussion. Some of the members had met with partial success, but most of them with failure. Of the different varieties, the Monarch of the West, Charles Downing and Captain Jack were favorably spoken of.

MEETING HELD AUGUST 18, 1880.

The Society held its monthly meeting at the residence of Hon. J. W. Williams, in the south part of the county. There were about one hundred members and visitors present.

At 10 o'clock A. M., Vice President Jacob Hixon called the Society to order, and appointed a committee to examine the orchard and grounds of Mr. Williams.

The following fruits were on exhibition:

By J. W. Williams—Apple: Golden Sweet, Sweet Nonsuch, Dominie, American Summer Pearmain, Maiden's Blush, Fall Pippin, Hubbardston's Nonsuch, Lowell, Red Streak, and two varieties unknown. Pears: Duchesse. Grapes: Concord, Catawaba, Isabella, Clinton. He also exhibited a fine specimen of high bush cranberry.

By Jacob Hixon—Apples: Autumn Strawberry, Fall Pippin, Early Pennock, and two varieties unknown. Grapes: Delaware and Isabella. Also, a Damson plum, and a Peerless watermelon.

By J. G. Bell—Apples: American Pippin, Gravenstein, Cooper's Early White, Black Gilliflower, Sheep-nose, Autumn Swaar, Rhode Island Greening, Jonathan, Willow Twig, and three varieties unknown.

John S. Hopkins, by D. U. Townsend—Pears: Bartlett, Osband's Summer. Plums: Yellow Gage and Lombard.

By I. T. Price—Plums: Lombard, exceedingly fine.

The Society then adjourned, that the ladies might prepare the feast of good things, while the committee attended to the work allotted to them.

At high 12, it was announced that the multitude should partake of the delicious viands which had been prepared for the occasion. The sound of instrumental and vocal music directed the initiated to the center of attracton. Here, within the cool shade of an artificial grove, was to be seen a feast fit for the gods—one that would have caused even Dr. Tanner to forswear his self-imposed fast. As Mr. J. C. Chase and family, assisted by some of the residents of Muddy, discoursed fine music, the members gathered around the tables, where for the next hour nothing seemed to be thought of but satisfying the inner man.

After clearing away the tables, the Society was called to order by Mr. J. Hixon, when Mr. D. U. Townsend read the following essay:

ORCHARDS AND ORCHARD CULTURE.

As a result of considerable observation on orchards and fruit growing, I find orchards in pretty much the same condition all over the country, esially the older ones. A majority of the latter are found to be in a decline, and in most cases evidently from the same causes.

The first mistake is made in training the trees, by heading too high, thereby exposing the trunk to the sun and hot winds; second, in planting too closely, in many instances the trees not being more than 16 feet apart. Could not this evil be remedied by removing part, cutting the rest back and cultivating by plowing and manuring?

To avoid these evils, let us in the future plant our trees 30 feet apart in the rows each way, and train them with low heads, in no case allowing the trunk to be more than 3 feet, and I should not object to even 20 inches in height. If the top is properly trained so that the limbs have an upward tendency, no difficulty will be found in passing anywhere between the trees with a team and wagon.

In preparing a plat for a new orchard of ordinary size, a little extra labor can well be afforded in the way of thorough and deep plowing, and a liberal supply of good manure. The soil should be light, porous and sandy, and no objection would be found if a little gravelly.

As to the situation for the orchard, I have not changed from the opinion already expressed on this point—a northeast, north or northwest slope; either being preferable to a southern exposure. As a reason for avoiding a southern slope, I have found many trees from five to eight years old, on ground with this exposure, with the bark blackened, dead, and separated from the tree. The cause is, that during occasional warm days in winter or early spring, the sap has commenced flowing, and by sudden, severe freezing, the sap is converted into ice, and by its expansive force bursts the bark loose from the trunk, causing it to turn black as from sun-scald.

We all know something of the ravages of the apple worm or codling moth. My observation has been that the fruit on our trees not cultivated, suffers most injury from this insect; as for example, in town lots and on heavily-sodded ground. Might this not be helped, or partially prevented, by stirring the ground and removing all fruit that falls from the trees, or better, by shaking off the wormy fruit and destroying it?

I wish here to touch on the subject of the pear and its culture, as many failures in cultivating this delicious fruit have caused many to abandon the hope of success. I am fully convinced that with proper treatment the pear can be successfully grown in our State—that is, by selecting hardy dwarf varieties, planting deeply, so that roots will form above the graft, thus securing standard trees, with the advantage of low top, and dwarf qualities of early bearing. This appears to change the nature of the dwarf, giving a healthy and vigorous growth. Upon inquiry, I find that trees having a vigorous appearance and giving good crops of fruit, have been treated to a small quantity of common salt two or three times a year; also iron rust is beneficial. This can be secured by throwing old iron around the roots. I have talked with persons who have given their trees this treatment, and who have not missed a crop for four years.

As to the peach, I am sorry to say that I have no very encouraging report to make to-day of the budded sorts. You are all too well aware that we have not had a crop of budded fruit for two or three years. I am of opinion that we must produce native varieties from seed. Now, as budded fruit originally came from seedlings, I believe that if we plant plentifully the seeds from the choicest seedling fruit, and when these trees come into bearing, save only those that bear choice fruit, and destroy the rest, then select the stones from those saved, plant, and go through the same process with the trees again and again, we shall obtain choice fruit, and that which will yield a crop every year. Seedling peaches seldom fail, but in quality they are almost worthless. I believe this theory deserves a trial, and should like to see it tested.

The subject assigned to me for this paper is so broad that I have merely touched on the points, still leaving an extensive field for discussion.

The committee to examine the grounds made the following report:

We, your committee, have examined Mr. J. W. Williams's orchard. We found the soil to be a black, sandy loam, sloping to the west. In the north part of the orchard, the trees were planted when one year old, at medium depth. Part of the orchard is twelve years old, and the trees are very large for their age; others are only six years old; these also are large for their age, showing the result of good cultivation. With the exception of Dominie, the crop of fruit is generally light; the most of the apples are on the east side of the trees, probably caused by blasting winds from the west and south. This orchard is in good condition. Your committee would recommend Mr. Williams to seed his orchard to clover next spring.

The vineyard we found to be in excellent condition; no cultivation this year; has been severely pruned; less rot this year than usual; vines very full. Your committee sampled them freely; found them good—yes, very good.

Raspberries and blackberries, found in good condition; currant bushes in good condition, planted on north side of fence; they bore full this season.

Pears: Trees in good condition.

Crop of small fruit large.

Peach orchard in splendid condition; budded fruit a failure; seedlings, light crop.

All of which is respectfully submitted.

David Blosser.
B. F. Bradshaw.
D. S. Hatch.

With many thanks to the Hon. J. W. Williams and his good wife, for their untiring efforts to render the meeting a pleasant one, the Society adjourned.

JEFFERSON COUNTY HORTICULTURAL SOCIETY.

(Organized January 24, 1880.)

REPORTED BY THE SECRETARY.

Officers for 1881:
President—J. N. Insley, Oskaloosa.
Vice President—J. E. Smith, Oskaloosa.
Secretary—J. N. Hall, Oskaloosa.
Treasurer—Jas. Maine, Oskaloosa.
Meetings are held monthly.

JOHNSON COUNTY HORTICULTURAL SOCIETY.

(Organized April 1, 1876.)

REPORTED BY THE SECRETARY.

Officers for 1881:
President—H. Perley, Spring Hill.
Vice President—W. W. McMillan, Olathe.
Secretary—D. S. McFarland, Olathe.
Treasurer—J. M. Hall, Olathe.

MEETING HELD JANUARY 10, 1880.

Mr. Perley presided.

Dr. Woodward delivered an interesting and instructive lecture upon the use of the microscope, and exhibited, under a very high magnifying power, numerous objects.

Mr. Case asks if a tree having a tap-root will live for any length of time after being transplanted.

Mr. Perley says he has transplanted nut-bearing trees nine years old, and most of them lived.

Mr. Case and **Col. Hayes** have had trouble in getting peach trees whose tap-root has been cut, to grow.

Dr. Woodward stated that cuttings of a well-ripened peach tree, cut from the last year's growth, between January 1st and February 15th, and set from 12 to 15 inches in the ground, leaving from 3 to 4 inches above, will grow if shaded in summer.

Mr. Perley would plant yearling peach trees, and asks what is the advantage if grown from cuttings.

Dr. Woodward replies, it saves grafting and avoids weakness at the point of grafting.

MEETING HELD FEBRUARY 14, 1880.

Mr. Perley presided.

The Secretary read the following article, upon

APPLE-TREE BORERS.

All good has its opposing evil. If Eve is to be censured for not leaving fruit on the tree, what shall be said of borers, that try to destroy the tree itself?

There are two kinds of borers, the round-headed and the flat-headed; each is the offspring of a beetle—the former the saperda bivittata, the latter the chrysobothris femorata. For a complete description, see Kansas State Horticultural Report 1878, and specimens with our entomologist.

Saperda Bivittata.—This is a nocturnal insect, and hence seldom seen depositing eggs. To get a specimen, we must be content to let the young develop into the full imago, and catch it when about to issue from the tree. The egg of this beetle is generally deposited in the trunk of the tree, close to the ground, though I have seen them all distances, from the surface to twelve inches above. Entomologists say one egg is deposited in a place, yet I frequently find two borers. It may be that where two are found, that they were deposited in different places, but if so, one nest was wholly obliterated; the borers were working in the same direction, while the canal was larger than where one was found. Very young borers are found early in June, and as the egg hatches in two weeks, it is inferred that in this latitude the egg is deposited as early as the last or next to the last week in May. They continue to be deposited until in October. As soon as hatched, they begin to bore into the bark, generally upward at first, then downward, sometimes passing spirally nearly or quite around a small tree. In one case I found it had left the trunk, passed out, and entered a large root. They are generally detected by their castings, as they pack these behind them, and the rising sap and rains swelling them, cause them to protrude from the opening. If a borer is suspected, and no casting is found, press with the thumb-nail or knife on the bark; if it gives, you may know there is a canal beneath, and the borer is or has been there; but generally he is so bad a politician that he cannot cover his tracks. The deposit of eggs on trees is not uniform; oftener one or two borers are cut from the same tree—not unfrequently six to ten. In one summer I cut forty from a single tree, but so soon after they were hatched that the tree suffered but little. I do not know, but am of the opinion that three winters intervene between the hatching of the egg and its full development into the imago.*

In no case have I ever found an egg deposited under the rough, scaly bark of a tree, but always upon a smooth surface. Unhealthy trees are more likely to be attacked than thrifty growing ones, but the healthy, thrifty tree is not free from attack, any more than a hale, hearty man is sick. The beetle is no more a respecter of trees than political parties are of the color of the voter, if he votes to suit the party.

CHRYSOBOTHRIS FEMORATA.—This beetle is diurnal in its habits. I have occasionally caught one. This requires skill. On approaching a tree, if you see what you suspect is a beetle, approach carefully, making as little noise as possible, raise the right hand in a position to grasp, pass the left hand slowly around the tree. The beetle will back out, watching the left hand. Don't give it time to look backwards, grasp quickly and surely, else you'll fail. If it is missed, you are rewarded with a heavy humming sound like unto a bumble bee, but unlike the bee, the sound receding instead of approaching.

This beetle deposits its eggs high up on the trunk, in the forks and on the limbs. I once cut them from a limb as high as my shoulder, and three feet from the main stalk. Castings are never or very seldom thrown out by this species, but a little dark spot may be seen, and from it a liquid substance usually oozes, discoloring the tree slightly. The practiced eye can easily detect it, while the unskillful would frequently fail. I have generally cut one from a single opening. In one case I cut five closely huddled together, in another seven, in another, so many I did not take the trouble to count.

DIFFERENCES.—The borers are distinguished by the names "round-headed" and "flat-headed," on account of the shape of that organ. The flat-headed in color is pale, as if sick of his occupation; has his tail turned generally around towards his head—resembling poverty "trying to make both ends meet." Its head is very much enlarged, as if he thought size of cranium indicated brain; at any rate, he outwits the wisest of us. The round-headed borer is of a light-yellowish color, head brown, horny, polished, and black.

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*In two winters.—SEC'Y.

REMEDIES.—The only effectual remedy is cold steel. Take a good pruning-knife, cut him out, cut him in two, then you know his course is ended. If he has entered the body of the tree, take a steel stay of an old umbrella, file one end into the shape of an arrow-head, follow him up with it, (the moisture on the iron will indicate when he has been reached—generally he will be impaled on the end of the steel barb,) draw him out and show no quarter; if this does not succeed, use a mallet and chisel. Do not bury, cremate, or even shed tears over the corpse. His injury to the tree is his monument. Obliterate this if possible by covering with moist earth or anything to keep the wound from drying out, that it may heal over as fast as possible.

Examine your trees carefully, not later than June 20th; repeat the operation by the middle of August, a third time between the 10th and 15th of October; and for fear some have been missed, go over the orchard in April. Too much time, you say? You *save time* and *temper* by such care; a good hand will examine, in April or October, if the trees have been properly attended to in June and August, when they are the worst, 600 trees per day with ease.

CONCLUSION.—In conclusion, I would say, plant trees; take care of them that you may enjoy the fruit, if not yourself, then your children or somebody else's children. He is a selfish man who looks only to himself; whoever plants trees on these prairies is a benefactor of the human race.

MR. PERLEY thinks the beetle lives only two years; and finds the borer in his own orchard two feet from the ground, in some of his neighbor's, four feet.

DR. WOODWARD cut, from a peach tree, a round-headed borer, as high as he could conveniently reach, February 13th, 1880.

MR. HINDMAN thinks a healthy tree is not attacked by beetles. When the borer gets into the heart of the tree, let it alone. Hunt the egg where it is deposited, and crush it.

He was asked if he kept them out of his orchard in this way, and answered that he had not.

MR. PERLEY is skeptical in the matter of killing eggs, and thinks no healthy tree exempt from the deposit. Round-headed borer eggs are deposited on smooth surface; flat-headed, on rough surfaces, usually where the wood and bark join, where a limb has been cut off. Can examine 200 trees per day.

MR. ROSINGTON asks if the flat-headed borer is identical with that of the soft-maple borer.

DR. WOODWARD has seen them in apple, soft maple, and hickory.

The Secretary asked leave, which was granted, to insert in the report the statement made by G. C. Brackett in the last State Report, which is as follows: "It attacks not only the apple, but the peach, pear, plum, cherry, soft maple, oak, mountain ash, linden, box elder, beach, elm, and willow."

DR. WOODWARD then read the following paper:

Mr. President: I beg leave to offer a paper on some questions of importance to all horticulturists.

From reports made from time to time by members of the New York and other State societies, some of them taken from the *Fruit Recorder*, it seems to have been proven that the ravages of the flat-head and round-head borers may be prevented by washing the crown, bole and large branches of trees with a wash composed of one pint of crude carbolic acid, three gallons of soft soap, dissolved in three gallons of hot water, to which is to be added ten gallons of cold rainwater. This is to be applied with a brush or old broom, filling all cracks or wounds, during May and June, which is the time when the beetle deposits its eggs. It is claimed that the mixture is so offensive to the beetle that it will avoid trees so treated.

It is claimed, and thought to be proven, that the "fire blight" or "pear blight" is caused by fungus on the bark, and kills the wood beneath. Raw linseed oil painted on the trunk and as far as possible on the branches, once a month through the months of summer, is said by reliable men who have tried it, to be a sure preventive; and if a tree is attacked by the disease, cut away and burn the trimmings, and then oil the cut ends. It is recommended also to slit the bark of the branches, and fill the slits with the oil. A whitewash of lime and sulphur early in the spring and again in the middle of summer, is said to be a preventive.

The great enemies of the strawberry are the grub, which cuts the crown and the roots, and the leaf roller, which attacks the plants about the end of the fruit season. Salt applied to the ground before planted, about two quarts to the square rod, will effectually clear the ground of these pests; and if the plants grown in hills or rows are attacked, sow the salt between the plants, but not on the leaves, and the grub will disappear. For the leaf roller, a solution of Paris green sprinkled on the leaves will destroy the worm; but the solution should be used two or three times, at intervals of a couple of weeks, till the leaves have ceased to grow. Strewing dry straw or hay over the plants, and burning it, is claimed as not only destroying the worm, but of benefit to the plant, if care is taken not to burn the crown of the plant. This last to be done as soon as the leaves are dead, in the autumn.

Another idea which seems of value is, that if coal-ashes are kept from rain, and made to receive wash-water and chamber slops, they will be found a valuable manure for fruit trees. The iron in the ashes will be in the best condition to be assimilated, and will tend to retain moisture. At the meeting in December, our President presented some apple-tree roots attacked by the root blight, requesting that an examination be made, and reported on. The roots were very dry, but when soaked in water and subjected to the microscope, found both dead insects and some kind of fungus. I could not determine which was primary, but as micelium, like that of some other fungoids, was seen, I was led to think the fungus was led on by the insect. This disease is said to be so contagious that it is recommended to burn every nursery tree so affected, and for those buying trees to examine them carefully and refuse to take any having the least appearance of the disease. Knowing as we do that no insect or fungus will live in the presence of carbolic acid, I should think watering the roots with soap-suds with the acid dissolved in it, would eradicate the pest.

I beg leave to state that for some years I have had no personal experience in these matters, but have culled from my readings those thoughts which recommend themselves to my judgment, and as such are offered to the Society.

The Doctor stated that Capt. Bacon, of Iowa, had tried linseed oil, and found it efficacious.

Mr. Marvin asked if the rough bark should be taken off.

It was generally agreed that it should be.

Mr. Perley finds dead and tight bark on trees. Wants information what to do He cuts it off.

The Secretary does the same, and finds no injury resulting from the cutting.

Mr. Marvin applies a strong solution of concentrated lye, one box to three gallons of water, applied by a swab. If tree is hide-bound, slit with a knife.

MEETING HELD MARCH 13, 1880.

Society met at 2 p. m., Rev. Mr. McMillan presiding.

After attending to some business matters, the Society proceeded to discuss the "best method and time of pruning fruit trees."

The discussion was opened by the Secretary, who is opposed to cutting off large limbs under any circumstances. Limbs thicker than a lead pencil should not be cut, and if proper attention is paid to the orchard, most of the trimming may be done by pinching. He trims at any time, but prefers the spring; finds wounds heal most rapidly when made in June. Heavily-pruned trees die.

Mr. Marvin cuts off large limbs and has no trouble with the trees living, provided they are in a healthy condition. Trees need light and sun. Pruned in the spring of 1879; had a heavy crop of apples, and the trees grew rapidly; applied a wash, and the wounds healed. The best time to trim is when one has time and a sharp knife; generally trims in March; cuts limbs two inches in diameter. Has noticed, in one or two cases, the bark underneath the wound discolored; but the trees were not in a healthy condition, borers having injured them. Trimmed a few years ago; the wounds are all healed, and the apples are larger and better; finds the largest limbs on the south side. Trims from the upper part of the limb, so as to make the branches project downward. The sap of the tree does not flow downward.

Prof. Kean asks, since in trimming the circulation is restricted, does it not act with more vigor, and produce better fruit? The grape, which is trimmed yearly, lives to a great age.

Mr. Rosington thinks the comparison of the grape will not hold good with the apple, since the grape grows on new wood. Pruning in summer tends to produce more fruit, and it is better to pick off the superabundance of apples rather than trim for that purpose. Trim early in winter, or soon after the leaves appear.

MR. MCMILLAN has not had much experience, but indorses to a great extent the Secretary's views. Tries to make the tree balance itself; trims when limbs are small; does not wait until they are large. Is of the opinion limbs should not be cut too close. Smooth the wound, and the more vigorous the tree the better it heals.

MR. BECKWITH: Pruning invariably injures the trees when limbs are an inch in diameter; thinks it dangerous in this climate. Pruning will have the same effect on size of apples, as plucking the superabundance. Has cut off trees and cleft-grafted, but lost the trees.

DR. WOODWARD confirms the killing of apple trees cut away and then grafted.

MR. BECKWITH thinks cleft grafting will do in New York, where he has known it to succeed, but Kansas is not New York. Trees decay sooner if injured on the south side. Intense cold in winter, followed by sunshine, causes the bark on the south side of the trees sometimes to become discolored, and unless it assumes its natural color, the tree dies. Trim early in the season.

MR. BOWEN agrees with the Secretary; does not want to cut limbs thicker than a pen handle; trims in winter, and leaves the limbs on the ground for the rabbits to gnaw; for ten years trimmed heavily, and injured his trees; trimmed to make trees grow to suit himself, but failed; the less pruning the better, except to remove water sprouts; when limbs are inclined to split the tree, bind them with common fence wire, placing old boot leather between the wire and limb. The part of his orchard trimmed, as he thought judiciously, is all dead. When a limb is cut, it begins to decay from that point down.

The general opinion expressed by the Society was, that if a limb is cut off, it should not be too close to the body.

DR. WOODWARD then presented the following, on Flax-seed Oil and Pear Blight: In addition to what I read to the Society at its last meeting, on the above subject, I beg leave to add that Dr. Chenowith, of Jefferson county, Ky., reported to the State Association "that he had found the application of the oil to his trees a perfect remedy for blight, after failing with various other things. The oil completely blackens the bark, a distinct line marking the covered and uncovered parts." I think the *rationale* of the matter is this: Every fungoid growth, as every insect, has breathing pores, through which air must pass to sustain life; linseed oil, more than any other vegetable oil, has a large portion of albuminoid matter in its composition. This albumen completely seals those pores, making them impervious to air; consequently they (the spores of the fungus) cannot develop, neither can spores from the air around find a suitable nidus in (or on) which to grow. The same of the insect: even if it be an animalcule, its breathing pores are so filled as to destroy it.

MEETING HELD APRIL 10, 1880.

Mr. Perley in the chair.

MR. BOWEN read the following paper:

THE BEST WAY TO HANDLE APPLES.

My experience and observation have convinced me that the best way to handle the apple is, with care. My instruction to hired help is to handle them as carefully as if they were eggs. Summer and fall varieties require less care than winter varieties. Those that are to be used in a few days may be shaken from the trees, but long keepers must be picked by hand. Apples must be left on the tree until they are perfectly ripe, then the sooner gathered the better. My mode of gathering is to hire two boys, give each a bucket with a hook attached to the handle; let one boy get into one side of the tree, the other upon the opposite side; hang their buckets in a convenient place and go to work. The small and defective apples drop on the ground, to be gathered up afterward and sent to the cider mill; place the good apples carefully in the buckets. I remain on the ground to pick from the lower branches and to empty the buckets, when filled, into a sack, and then haul to the house on a sled. Myself and two boys will gather 50 bushels per day.

As apples are brought from the orchard, they must be put in a cool, dry place, that they may go through a sweat. Use rail pens for the purpose. In four or five weeks they will do to sort over, and then move the good apples into winter quarters. A good cellar makes good winter quarters. Store in bins four feet wide, four feet deep, and twelve feet long. After the bins are full, cover the apples with paper. They keep best in the dark. Each variety must be kept separate, and remain undisturbed until ready for market.

Apples should never be pitched and tumbled about, but whenever handled, care should be used to avoid bruising. Never pour or turn them out of a sack, but lay the sack carefully down, take hold of the lower end, and pull it gently off the apples.

Always grade into first and second classes. Sound and fair-sized form the first, sound and undersized the second class; small, imperfect and defective ones, carry to the cider mill. Every producer of fruit should take pride in placing his fruit on the market, not only in an attractive shape, but also in a condition that will command the highest market price.

Pick in October. I prefer a one-bushel sack to a box.

EVERGREENS.

J. M. HALL has been tolerably successful in growing evergreens. He brought from Illinois the balsam fir, Norway spruce and arbor vitæ, and obtained red cedar in Kansas. Austrian and Scotch pine grow well. Norway spruce can be made a nice tree, but the climate is not favorable; almost every year finds the leaders killed. In planting, make the holes large, and plant near the surface. Transplant when the new growth has commenced. Keep the roots moist, else the tree fails.

MR. PERLEY some years ago planted 2,000 Norway spruce, 6 inches high; they are now from 10 to 12 feet high, and he has observed no leaders killed till last year. Prefers red cedar for hardiness and Norway spruce for wind-breaks. Recommends red cedar, white pine, Scotch pine, balsam fir. Does not like Austrian pine, as they turn brown in winter. Transplant about the time they begin to grow. Care must be taken to keep the roots moist.

CURRANTS.

DR. WOODWARD recommends placing rocks in the holes where currants are set. Thinks they are good for root draining. Has been successful in Illinois by that method, as well as with the quince.

MR. HALL thinks rocks good for any shrubbery. Currants need shade and deep mulching. Planted in the apple-tree rows, and had no trouble until the grasshoppers killed them.

PEACH.

THE SECRETARY stated that Mr. Maxwell recommended seedling peaches grown from pits of budded fruit isolated from influences of seedlings, and asked for information.

MR. PERLEY discarded seedlings.

REV. MR. MCMILLAN said that ten or twelve years ago he brought a sack of pits from Illinois for a neighbor; these produced excellent fruit. Has planted the pits grown from them, and they have produced the same kind. Cannot say that they will always reproduce.

MEETING HELD MAY 8, 1880.

The Secretary showed specimens of the "rascal leaf crumpler," stating that they were denuding parts of his orchard, and asked for a remedy.

DR. WOODWARD recommended Paris green or London purple, applied with a sprinkler; also to pass through the orchard with a lighted taper in night-time, and kill the moths by alluring them into the blaze.

DR. WOODWARD asked for a method of catching the May beetle.

THE SECRETARY recommended that tin buckets or any smooth-surfaced vessel, partly filled with water, be placed on the ground, with a lighted torch near by. The light would attract them, and they would fall into the water and be drowned.

MEETING HELD AUGUST 12, 1880, AT THE HOUSE OF MR. PERLEY.

The meeting was large, and the weather pleasant.

MR. PERLEY placed on exhibition 61 varieties of apples, besides pears, peaches, grapes, etc. His orchard of 3,500 trees is a model of neatness and thrift.

MEETING HELD DECEMBER 11, 1880.

ORCHARDS.

Upon the subject of borers, McFarland, McMillan, Hubbard, Bowen and Hayes reported the insect scarcer this season than ever before. Mr. Perley finds many, and relies on the knife for protection. A wash of alkali and soap may assist.

On motion, the Society declared by vote that the only successful remedy against the borer is to remove it with a knife. To the question, "Are borers worse in one locality than another?" it was generally answered "No, if proper care has been taken."

LABETTE COUNTY HORTICULTURAL SOCIETY.

(Organized January 17, 1876.)

REPORTED BY THE SECRETARY.

Officers for 1881:

President—J. L. Williams, Oswego.

Vice Presidents—First, C. G. Braught, second, Gilbert Stover, Oswego.

Secretary—H. S. Coley, Oswego.

Treasurer—J. A. Gates, Oswego.

The following is a summary of the proceedings of the Society for the year 1880:

The past year has been very satisfactory to the horticultural interests in the county; the Society has nearly doubled its membership, and a largely increased interest has been manifested by all the members. The acreage of fruit during the past year has been largely increased, and those of us who are engaged in raising fruit for profit, as we add up the sales for the year, are very well satisfied with the results.

FIRST MEETING.

The first meeting of the year was held at the residence of the President, J. L. Williams, June 5th. Owing to the heavy rains during the day, many members were unable to attend, but there was a fair attendance.

The President promptly called the meeting to order at the appointed hour.

The minutes of the preceding meeting were read and approved.

The subject of the strawberry was introduced, and after hearing the remarks of several members on the subject, the Society recommended but four kinds, viz., Wilson's Albany, Charles Downing, Monarch of the West and Kentucky (late.) Houghton's gooseberry was also highly recommended for this locality.

Owing to the threatening weather, the Society adjourned early, to meet at the residence of the Secretary, June 15th.

MEETING HELD JUNE 15, 1880.

The Society met as per adjournment, on above date. The day was fine, and the attendance above the average.

The meeting was called to order by President J. L. Williams.

Minutes of the former meeting read and approved.

There was a fine collection of fruit exhibited by N. Sanford, C. O. Perkins, J. B. Draper and H. S. Coley, consisting of ripe apples, peaches, cherries and raspberries. The Society would recommend an addition to the strawberry list named at former meeting, viz., the Sharpless. Would recommend, also, that a much larger amount of cherry trees should be raised, as large orders have been received by nurserymen that could not be filled. The kinds recommended were the Richmond, English Morello, Belle Magnifique, and Gov. Wood. On the subject of raspberry, the Society report McCormick the best black, and the Turner the best red berry for cultivation.

Dinner being announced, the Society gathered around the table loaded with the delicacies of the season, to which all did ample justice.

After dinner the Society took a look at the orchard of the Secretary, which was found to be in a fine condition, the trees being well loaded with fruit, the apples especially so.

A committee of three was sent to the residence of C. O. Perkins, to examine his trees and show for fruit. The committee on returning reported that they found everything in nice order on the premises, the grape and plum crop remarkably heavy — curculio, however, having damaged the plum to some extent.

The Society adjourned to meet at the residence of C. G. Braught, July 3d, for a picnic.

MEETING HELD JULY 3, AT THE RESIDENCE OF C. G. BRAUGHT.

The day being stormy, many of the members were unable to attend.

The meeting was called to order, and the minutes of last meeting read and approved.

The display of fruit by Messrs. Sanford, Braught, Coley and Williams was the finest of the season, consisting of apples, peaches, blackberries, plums, and crabs. The display made by the Secretary, of Early Harvest, Red June and Astrachan apples, was exceptionally fine.

After discussion of the plum subject, three kinds only were recommended, namely, Wild Goose, Missouri, Texas and Chickasaw varieties, the last two named being scarcely ever troubled with curculio, all other kinds suffering greatly by this pest. The subject of the apple was then introduced.

Mr. Braught wanted to know why it was that a great many apple trees only bear on the north side of the trees.

Mr. Sanford stated in his opinion it was caused in a great measure by the high winds prevailing from a southerly direction, which destroyed many blossoms on that side of the tree, and by the excessive heat of the sun on that side, causing the bloom to fall.

MR. COLEY took the position that low heading would remedy the difficulty; that the principal cause was trimming too high, leaving the body exposed to the sun, which in this locality was very hot during the months of July and August, so much so that it scalded the south side of the tree, causing the bark to peel off in many instances, thereby stopping the flow of sap; and but very little if any bloom was ever thrown out on that side. He further stated, that on all trees where the trunk was well shaded, you would find no perceptible difference in the fruiting.

After further discussion on the subject, the Society decided the reasons of Mr. Coley to be correct.

Varieties of early apples recommended—Early Harvest, Carolina Sweet, Carolina Red June and Astrachan, the last a shy bearer, but of excellent quality.

Quite a number of new members were added to the list, and after taking a look over the orchard of Mr. Braught and returning a vote of thanks to Mr. and Mrs. Braught for their efforts to make the meeting a success, the Society adjourned to meet at the residence of Gilbert Stover.

MEETING HELD AT THE RESIDENCE OF G. STOVER, JULY 16, 1880.

The day was fine, and there was a large attendance. The minutes of the last meeting read and approved.

There was a fine display of fruit exhibited; among the lot was the Gregg raspberry, which was the finest berry of the season. It was raised by Dr. Conner. The Society do cheerfully recommend it in this locality. A small freestone Green Gage plum was exhibited by the Secretary, which, after four years' trial, has never been troubled with curculio.

Dinner was announced, and all adjourned to the table, and after partaking of the abundance thereon, the Society resumed business.

A great many complaints were brought before the Society in regard to the peach rot. It was found the early peaches were most subject to this disease. After careful investigation, the Society believe the cause to be wet weather, and recommend for early and medium peaches, land thoroughly drained, for late peaches just the reverse; very little, if any trimming. And while on this subject, viz., the subject of trimming trees, the Society would advise all persons whenever a tree-trimmer comes along, be it apple or peach, give him a cold reception. A small amount of pruning for apple and none for the peach, is recommended in this locality. Tree peddlers were handled without gloves.

MR. COLEY said while out in Chautauqua county, he saw some Ohio men deliver $1,700 worth of trees, or rather their bills called for that amount; one-fourth of the trees were dead; the Bartlett, Seckel, and several other common varieties of pears, were labeled with some highfalutin names, and were sold to the farmers there for from one to one and one-half dollars apiece, when they could have been bought at any home nursery at from twenty-five to forty cents each. As far as this Society is concerned, no foreign tree-peddler need apply.

The Society adjourned to meet at Barnes's Ferry, July 30th.

MEETING HELD AT BARNES'S FERRY, JULY 30, 1880.

President in the chair. Minutes read and approved.

The meeting was largely attended. A magnificent display of fruit was placed on the tables, and a committee appointed to examine same and report.

Adjourned to dinner.

After partaking of a bountiful repast, the Society renewed business.

A resolution was adopted, that the Society make a display of fruit at the coming county fair, also at the Mississippi Valley Fair Association, at St. Louis.

Rain began to fall, and Society adjourned to meet in Oswego next regular meeting.

One hundred and twenty varieties of apples were sent to the Horticultural Fair, at St. Louis, besides twenty varieties of pears, peaches, etc. This being the only county in Kansas represented on that occasion, and not having attended a fair of that magnitude, we supposed that the finest fruit was the largest and best matured of the kind shown; but in that, according to the views taken by the judges there, we were mistaken, as they decided that the Bartlett pears we exhibited, weighing seventeen ounces, and perfect in every respect, were too large and overgrown, and awarded the premium to an eight-ounce pear. The same difficulty in the minds of the judges caused us to lose the Duchesse pear and Maiden's Blush apple, and many other specimens. Notwithstanding their decision, this Society will continue raising large pears.

All kinds of fruit have borne heavily here this season. No blight; wood growth excellent; curculio the only insect doing material damage.

The following is a list of apples recommended by the Society:

Early Apples—Early Harvest, Carolina Red June, Red Astrachan, Carolina Sweet.

Autumn Apples—Maiden's Blush and Rambo.

Late Fall and Early Winter—Jonathan, Fallawater, Shannon's Pippin, Ladyfinger, and Buckingham.

Keepers—Willow Twig, Ben Davis, Rome Beauty, Winesap, Rawles Genet, and White Winter Pearmain.

LEAVENWORTH COUNTY HORTICULTURAL SOCIETY.

(Organized May, 1861.)

REPORTED BY THE SECRETARY.

Officers for 1881:

President—L. L. Terwilliger, Lansing.
Secretary—A. G. Chandlee, Leavenworth.
Treasurer—E. J. Holman, Leavenworth.

But few meetings were held in 1880.

LYON COUNTY HORTICULTURAL SOCIETY.

REPORTED BY THE PRESIDENT.

Officers for 1881:
President—R. Milliken, Emporia.
Vice President—J. V. Randolph, Emporia.
Secretary—C. L. Hartman, Emporia.
Treasurer—Wm. Hollingsworth, Emporia.

This Society made a very successful year's work in 1880. The meetings have been pleasant and profitable. The plan of alternating the meetings between the city of Emporia and surrounding villages during winter months, and in summer of the form of picnics, was adopted with satisfactory results. Exhibitions of horticultural products are made a prominent feature during these meetings. Small premiums are offered for the production of new fruits and vegetables.

The Society will enter upon the new year, 1881, with more vitality and promise of good work than has characterized its proceedings for years.

MANHATTAN HORTICULTURAL SOCIETY.

(Organized January 24, 1874.)

REPORTED BY PROF. E. A. POPENOE, SECRETARY.

Officers for 1881:
President—T. C. Wells.
First Vice President—Prof. J. D. Walters, State Agricultural College.
Second Vice President—Prof. G. H. Failyer, State Agricultural College.
Secretary—Prof. E. A. Popenoe, State Agricultural College.
Treasurer—S. D. Moses, Manhattan.

During the year 1880, the Society has held meetings regularly upon the second Thursday of each month, excepting the months of October, November and December. These meetings have been fairly well sustained in interest. Since the publication of the last annual report, the Society has met with serious loss in the death of its Secretary, Mr. Ambrose Todd, one of its most efficient and enthusiastic members. At the annual meeting, held on January 27, 1881, the following resolutions of respect were adopted:

Whereas, Since our last meeting, Providence has removed from among us by death, a highly-esteemed and valued member of this Society, in the person of the late Secretary, Mr. Ambrose Todd: therefore,

Resolved, That in this visitation the Society has sustained a loss which is deeply deplored. Enthusiastically interested in horticulture, a diligent student of the science and art in furtherance of which this Society has been organized, an active and efficient member and officer, his place cannot soon be easily filled.

Resolved, That we here record our appreciation of his qualities, not only as a member and officer of this Society, but as a citizen, a neighbor and a Christian. His purity and worth were recognized in all the relations of life.

Resolved, That these resolutions be spread upon the records of the Society, published in the local papers of Manhattan, and likewise transmitted to the Secretary of the State Horticultural Society for publication in his annual report.

T. C. WELLS,
JAMES H. LEE,
E. A. POPENOE,
Committee.

Papers upon topics of horticultural interest have been presented at each meeting, and these have been followed by more or less extended discussion, participated in by all. The following list of subjects are among those presented: "Hardy Ornamental Shrubs and Perennial Herbs," "Pruning," "Tree Planting," "Small Fruits,"' "Care of Growing Plants and Vegetables," "Plant Growth," "Wayside Notes on Horticulture," "Horticulture in Switzerland," "Notes on Economic Entomology. Some of these papers are furnished as a part of this report of proceedings.

A few promising new seedling fruits have originated on the grounds of some of the members, and have been shown at the meetings. Among these are several varieties of apples that may call for further notice.

The following papers have been presented at meetings of the Society:

EXPERIENCE WITH SMALL FRUITS.

(*Read at the April meeting, by T. C. Wells, President of the Society.*)

Those of us who came to Kansas twenty-five years ago will remember that we had very little variety on our tables in those days. Corn bread and bacon, "flap-jacks" and molasses, were the staple articles of diet. Vegetables, even potatoes, were scarcely to be had; canned fruits were unknown, and no fresh fruit could be obtained, not even the wild fruit of the land, for the time of ripe fruits was "not yet." We had no railroad then to bring us Michigan apples, and vegetation was slow to start, for the spring of 1855 was very dry. No rain fell until about the first of May. We remembered then the orchards and gardens of our Eastern homes. When at last the rains came and the grass started, the prairies were searched for "greens," and not always with the best result; for on one occasion, at least, the Indian plantain (*Cacalia tuberosa*) was mistaken for the common plantain, and there was "poison in the pot." For want of something better, the young fruit of the ground plum was cooked, and we called them "prairie peas" (*Astragalus caryocarpus*). By-and-by, as the season advanced, wild fruit was obtained. Scattered here and there on the prairies, a few small patches of wild strawberries were found. Then came the wild gooseberries and blackcap raspberries, on the creek bottoms and in the ravines. I found no ripe blackberries until several years after. Later in the season, we feasted on wild plums;

and the grapes were by no means to be despised, though small, seedy, and sour.

Excuse this prelude — you wanted my experience with small fruits. I made my first strawberry bed in the spring of 1858. Selecting a spot as much sheltered as possible, spaded the soil deep, making it fine and mellow. The plants used were wild ones from the prairies, for we had not thought then of getting plants by mail, and there was no express. They grew and bore well, and although the berries were not three inches in diameter, or even in circumference, they were much larger than when growing wild, and of excellent quality. We enjoyed the fruit from that bed for years. Ten years after, on another farm, I made a new bed, and planted wild vines again, and also some of the cultivated varieties, and I have since tried others. Of these, the Agriculturist all died before fruiting; the Jucunda lived along for two or three years, then dropped away; Owen's Seedling proved hardy, and the fruit sweet and good, but very little of it; Triomphe de Gand and Col. Cheney are much like Owen's Seedling; Napoleon III, hardy, fruit rather small, but good; Wilson, fruit of good size, but sour, and the vines are not as strong and thrifty as others bearing better fruit; Metcalf, very early, berries soft and deficient in flavor — only valuable on account of its earliness; Nicanor, early, quality excellent, medium size; Boyden's No. Thirty, good quality, fair-sized berry; Green Prolific, hardy, first picking of berries large and good, afterwards they are ill-shaped and small; Kentucky, latest of all, and good every way; Charles Downing, good in size and quality of berry; Hovey's Seedling is an old variety, and has given better satisfaction than any other, of excellent quality, fair size, hardy and prolific — it is a pistillate variety, and some plants with perfect flowers must be set near them to make them bear. Of the kinds which I have tried, I prefer the Hovey, Nicanor, C. Downing, and Kentucky. Strawberries require good soil, and thorough cultivation all the season, and a slight protection in winter. Some new varieties which are highly recommended, such as the American, Sharpless and others, I have not tried.

Of the blackcap raspberries, I have tried the wild, from the woods; by selecting the plants when in fruit, very good berries may be had, but it is probably better and cheaper in the end, to buy some of the improved varieties. Davidson's Thornless is very early, and a good sweet berry of fair size, but is a little tender in exposed situations. Doolittle comes a little later, about the same size, fair quality, and more hardy. McCormick, still later, large size, and bears immense crops. I have not tried the Gregg, but it is recommended as more hardy and of larger size than the McCormick.

Among the red raspberries, the Clark is excellent but tender; the Turner is the only one in this class that I can recommend for general cultivation, and this needs some protection, but is a good berry. All raspberries are less liable to be winter-killed, and give better results, when planted in partial shade, as near trees or a fence.

Among blackberries, the Lawton is very good when fully ripe, which is not until some days after turning black; it is, however, liable to winter-kill. The Kittatinny is much more hardy, and a large, good berry. The Snyder is said to be still more hardy, and good quality. Blackberries do not require high cultivation nor very rich soil. The young shoots should be pinched back when three or four feet high.

Among gooseberries, I have succeeded only with the Houghton and Pale Red or American Seedling.

In currants, the old Red Dutch and the White Grape are as productive and good as any. The Versailles has very long branches, and the Cherry is very large, but sour and not very productive. Currants do very well north and east of a fence, or in the partial shade of trees. I have planted many in the full sunshine, sheltered from the wind; they are full of blossom buds, but whether or not they will bear enough to be profitable without some shade, remains to be proven. Currants require much pruning, and a rich, well-cultivated soil.

I have described the above fruits as they have behaved with me. In other soils or with better cultivation, the results might be different.

PLANT GROWTH.

(*Abstract of a paper read by Prof. G. H. Failyer, of the State Agricultural College, at the May meeting of the Society.*)

The elements composing plants have been designated as belonging to two classes of substances: the volatile portions — those that escape in the gaseous form when the plant is burned; and the fixed — those that constitute the ash. The latter are derived entirely from the soil, and constitute from one to five per cent. of the dry weight. Among the various substances that have been found in the ash of plants, the following are invariably present in agricultural plants: Potash, soda, lime, magnesia, and oxide of iron, as bases; and as acids, chlorine, sulphuric acid, phosphoric acid, silicic acid, and carbonic acid. The total amount of ash varies greatly in different plants, and in different parts of the same plant. There is also the same lack of agreement in the relative proportions of the several ash ingredients. In some plants or parts of plants, silica predominates; in some, potash; in others, phosphoric acid, etc. The ash ingredients may serve a useful purpose in the plant. Sulphur is an essential constituent of albuminoids, phosphorus, or the phosphorized oils, that act as a medium for the transportation of the already-prepared proximate principles of plants. Iron is essential to the formation of chlorophyl grains, without which no carbonic anhydride is decomposed, and no true growth can take place. The alkalies seem to act as bases with which the organic acids can combine. But there is generally an excess of these fixed materials, that performs no essential office whatever. They are in solution in soil water, and with it enter the plant. Some of these superfluous ash ingredients remain in solution in the plant juice; a portion may form an incrustation on the cell walls; while in many cases they are excreted or thrown off, and appear upon the surface of bark and leaf. Silica belongs rather to these superfluous substances than to the essential. It was supposed that silica gives strength and rigidity to the stems of plants. But it is now known that the strength of stems depends but little upon the presence of silica. The rigidity is imparted by the absorbed water. The cereals and other plants experimented upon have been grown in a solution nearly if not quite free from silica. These plants were no more inclined to lodge than plants grown in ordinary soil; though the latter contained a much larger portion of silica. These ash ingredients have been supposed to be of chief importance. They are important, even necessary; that is, a certain small amount—small as compared with the whole plant. But they are less liable to be deficient in a soil, and need occasion little solicitude, phosphorus and potash being the only ones that are often lacking.

But the study of the volatile portions of plants is by far the more interesting. It is here that we come more directly in contact with the forces of nature, for imprisoned in these portions of the plant is all the power of the animal world, as well as the power of the engine, and the heat of our stoves and furnaces.

Plants contain a variable per cent. of water; common forest trees contain from thirty-five to fifty per cent. of liquid water; succulent herbs, from eighty to ninety, and in some cases even ninety-five per cent. This water is supplied entirely by the soil water. The leaves of trees and of agricultural plants have no power to absorb watery vapor from the air; they absorb scarcely an appreciable amount during a rain storm. The water absorbed from the soil, with the substances held in solution, constitute the so-called crude sap.

The greater portion of air-dry plants is cellulose in some of its modifications. Cellulose is composed of carbon, oxygen and hydrogen, the two latter in the proportion to form water, and may be considered as derived from soil water. The carbon is furnished by the carbonic anhydride of the air. Though the great mass is cellulose, the nitrogenous portions are of great importance. The working, transforming, building principle contains nitrogen. When plants are burned or decay, the oxygen and hydrogen unite to form water; the carbon unites with oxygen of the atmosphere, and escapes as carbonic anhydride. The nitrogen may form nitric acid; it may escape as ammonia, or even as free nitrogen. A portion of the sulphur and phosphorus also enters into gaseous combinations.

But to turn to the forces and means by which the elements are released from their tighter bonds in inorganic compounds and built up into more complete and unstable forms.

The green coloring matter of the leaf, called chlorophyl, gives it the power to decompose the carbonic anhydride of the air. The carbon is fixed in the plants, and the oxygen set free. This fixation of carbon occurs only in sunlight. In the night, an opposite process takes place: the oxygen of the air, uniting with the carbon of the plant, is respired as carbonic anhydride. This is analogous to the respiration of animals. Moreover, this absorption of oxygen and evolution of carbonic anhydride goes on at all hours of the day and night; but in sunlight this is masked by the far greater opposite process. As much carbonic anhydride is decomposed in twenty minutes of bright sunlight as is given off in twenty-four hours.

Reverting to the soil water entering the plant by the roots, and, for the most part, carrying with it the salts held in solution, the sap may be properly considered in this place. The plant seems to have a certain selective power over the mineral matters carried in by the current of water. This action is principally exerted over those substances that are insoluble in water, but are brought into solution by the acid juices of the plants. This action of the roots of plants may be shown in various ways. Polished slabs of insoluble minerals placed at the bottom of vessels, some bearing plants, others containing only the soil. The slabs upon which the roots rested were in every case roughened; where no plants were grown, the slabs did not lose their polish. Some plant roots give an acid reaction, and the substances absorbed are frequently found in combination with organic acids. The seat of this absorptive power is the root hairs. The force with which water is absorbed is very great. A grapevine cut at the crown, and a pressure gauge attached, has been known to sustain 32½ inches of mercury. It is this absorption at the roots and pushing forward through the stem, that causes the bleeding of vines, the flow of sap from the maple, and in greater or less extent from nearly all severed stumps. But we must not conceive that there is a flow of sap through the tree independent of its escape. When a maple is cut at close of winter, the sap flows; but it was not in motion previously. The tissues are full of juice under great pressure. The tree is confined in a nearly impervious layer of bark, and there is no channel for the escape of the confined liquid. But when the bark and new wood are perforated, there is a flow from all sides. The tension on the interior is increased by the expansion by heat of the contained air. When the tree is in leaf there can be no such internal pressure. The evaporation from the leaves is too great. There is but one true flow of sap in the tree—from the soil through the roots, stem, branches and leaves into the air. This is maintained by the hygroscopic nature of the roots and the evaporation from the leaves. The current of elaborated sap from the leaves down through the cambium layer which was once supposed to exist, is a misconception. The proximate principles built up in the leaf do pass down, and they do this against the current of water flowing up to supply that evaporated. The sap does not leave the tree in autumn and return in the spring. A tree removed from the stump in dead of winter will flow as freely for a limited period next spring as if left attached. The summing-up of this whole matter of sap circulation is, that evaporation causes a flow of water through the tree and into air; that so far as the plant is concerned, this is an accident. Plants grow where this transpiration is checked, but the substances organized by the leaves move independently of this flow; they go wherever they can supply a want; this may be upward, to supply the buds, the elongating stems and the fruit, or it may be downward, to feed the trunk and the roots. The force which impels them is osmose induced by chemical action. In biennial root crops, the root is the focus of motion during the first year. The current is reversed during the second, and the store laid up in the root is entirely exhausted for the support of flowers and fruit. In both years the motion of water is from the soil to the leaves.

The direct source of nitrogen is the soil. An inappreciable amount may come directly from nitrogen compounds in the air. Its compounds in the soil enter the plant by the root; osmose to the leaf; these are united with other elements, and form the albuminoids. These albuminoids occur in the growing parts, in the seeds, and in all those parts that serve as store-houses. But in the old and virtually dead parts they are wanting.

The leaf is the retort in which all vegetable matter is formed. Other things being equal, the greater the leaf surface the greater the wood growth. This growth may not in all cases be where it is desired. Hence, judicious pruning is highly beneficial. But the crude notion that the chief food supply is from the earth, and that the young tree should at once be headed to the height desired for the grown tree, in order that all the growth that might occur in these superfluous lower branches may be transferred to the body of the tree, is held neither by truly practical nor scientific men.

WAYSIDE NOTES ON FRUIT CULTURE.

(*A paper read before the Manhattan Horticultural Society, May 13, 1880, by C. D. Palmer.*)

Mr. Palmer prefaced his paper by remarking that a finished production had not been attempted, and should not be expected. The topics had been treated as they had presented themselves, and the paper should be considered as disconnected and fragmentary in form. I have called these jottings "Wayside Notes on Fruit Culture."

"Take it up tenderly,
Lift it with care—
Fashioned so slenderly,
Young, and so fair."

The importance of the subject must be my excuse for the license I have taken in adapting the beautiful lines of Hood to the planting of young trees.

I have seen men make a few fierce jabs with a spade, catch up the young tree with a jerk, jam the roots into the hole, throw in a few clods of earth, stamp and dance upon them as though killing a rattlesnake, with the muttered exclamation, "There, blast you, grow!" If the poor trees struggle hard for life and persist in growing, the stock are allowed to forage upon them at will; the grass and weeds spring up and choke them; the sprouts and gnarled limbs are never pruned away, and fine varieties degenerate again to a state of wildness, and refuse to bear fruit. Such men as I have indicated, say they "Never have any luck with orchards."

No observing man can travel through these counties without being able to see at a glance why so many farmers have lived here twenty years without tasting fruit of their own raising. The history of our most valuable fruits, tubers and esculent roots is familiar to all. Our finest apples were developed from worthless crabs; our luscious peaches from a worthless almond; our countless varieties of potato from a wild American tuber. Indeed, the list is as long as the list of valuable varieties. Let culture cease, and they return to their original wildness.

The same principle holds good when applied to our domestic animals. A Wisconsin farmer lost two colts in early winter; they had wandered away, he knew not whither. The winter was one of deep snows and intense cold. When spring returned, the colts returned from the dense forest that had sheltered and sustained them. The farmer knew his colts, but they were wild colts—wild in action, habits and appearance, with hair on their bodies three inches in length.

I will not weary you with illustrations. I would speak with becoming modesty, but it seems passing strange that there should be so great a diversity of opinions in regard to the care of fruit trees. Said a gentleman on Fancy creek, "I never prune—I don't believe in it. My orchard began to bear in four years from planting—*that is, a few apples.*" *Yes,* a *few;* but I know an enthusiastic German in Wabaunsee county, who is never so happy as when in the top of an apple tree slashing off what he calls *"no goot pranches,"* and he raises more and better apples from one young tree than my Fancy creek friend gets from his entire orchard. Is he killing his trees? Not much. They are as smooth, and bright, and thrifty as young box elders.

A thrifty farmer on the Blue bottom said to me, "I have a sound, well-grown orchard, trees eighteen years old, that has never borne an apple. You gentlemen must tell me what to do." I said, "prune." He said, "I don't believe in it." "Then I can't help you."

A worthy gentleman in Wabaunsee county said to me, "Whatever endangers the life of the tree will make it bear." So it will, but is this necessary? We know that if the wind carries away half of a mature apple tree, the remaining half often bears tremendously, but is not *this* the hint, the philosophy, that if we will prune away the excess of wood we shall have a surplus vitality for fruit?

Charles Lamb says a Chinaman once found a nicely-roasted pig in the ruins of a shanty that had been accidentally burned, and that for a hundred years the Chinese, every time they wanted a roasted pig, burned the pig-sty with the pig in it, without thinking of any cheaper way to roast a pig.

"Whatever will endanger the life of the tree," etc., etc., seems like saying that for a man to perform his best work, you must amputate one of his legs, or throw him into consumption or some other incurable disease. I have invariably found that where fruit trees have reached maturity without bearing fruit, whatever else may have been done for the trees, no pruning had ever been done. One gentleman said to me, "What is the use to buy fruit trees for Kansas? They will not bear after they get large enough. I have a perfectly sound pear tree, eighteen years old, that has never had even a blossom."

"What have you done to it?" I asked. "I have never touched it," was his reply; "I can prove to you that I have never touched it." This spring some one advised him to endanger the life of the tree, and he cut away one of the main branches, four inches in diameter.

For many years the large immigration to the West has drained some of the New England States of their young men, and many of the old sterile farms have been in a great measure abandoned. These farms were all originally wrested from the forests, and the forests are now reaching out and claiming them again. It is no uncommon thing to see old apple trees still living among forest trees of large size, but the apple trees have assumed wild forms, habits and appearance, while the fruit they bear, if they bear at all, has so far degenerated in size and flavor as to be no better than the wild crab apple of the Western States. They have, trees and fruit, lost all traces of human culture, and become wild again. The philosophy of all this seems too obvious to require any further illustration.

HIGH VERSUS LOW LAND, FOR NURSERIES AND ORCHARDS.—Nearly all nurserymen and orchardists agree that fruit trees should be reared in the neighborhood where they are to be used. In other words, that the climate, soil, drainage, exposure and altitude of land of the supplying nurseries should be as nearly as possible the same as the orchards supplied. The record of apple trees raised on the high ground or benches of the college hills, is of the very highest. I have used some care in tracing the history of trees sold at the college sale three years ago, and have found the percentage of loss to vary from one-fourth of one per cent. to three per cent. They have been universally thrifty, hardy, and symmetrical in form, free from disease, and wonderfully precocious in bearing, many of them having already borne fruit. It seems to be true that the amount of growth a young apple tree should make ought to be limited to the amount of new wood it can perfectly mature and ripen. The new growth at the approach of winter should be as fine and hard as boxwood. As a rule, the apple trees propagated on the benches mature all their wood to the terminal buds. I cannot speak with the same confidence of fruit trees propagated upon the low lands of the Kansas river. The soil is less compact than on the high lands, roots strike deeper, the heat is more intense; the young tree makes an enormous growth, but what it excels in growth, it loses in fineness, hardness, and ripeness of fiber. As the heat is more intense in summer, so is the cold more intense in winter, and the soft, coarse, unripe, overgrown young tree is but illy prepared for these opposite extremes of temperature. One gentleman told me that he took all his young peach trees from the rows and buried them in trenches, to keep them through the winter. One of his neighbors left his standing in the rows last winter, and lost them all. As it is not always convenient to *take in* our trees for winter, fineness and ripeness of wood seem very important. It is also pretty well established that coarsely-grown trees do not bear fruit first class in quality. Many instances of this have come within my investigations. Peaches, while not always smaller, are coarse in grain, dryer, and perceptibly lacking in flavor. Apples show even greater differences: they are coarse in grain, lacking in juice and flavor, premature in their ripening, and likely to be poor keepers. Several well-known varieties, always classed as *winter*, on the high lands, become rather poor *fall* apples, on the river bottoms. Though I have many proofs to adduce in support of all these statements, I do not desire to speak too confidently, and, as the truth only is sought, shall be only too glad to correct any error into which I may have fallen in making these observations.

GRAFTING ON WILD GRAPES.—A German living on the east branch of Mill creek, in Wabaunsee county, while showing me through his fine orchard and vineyard, gave me a very interesting account of his success in grafting the Catawba upon the wild grape. He said, "I had de vild grep growing in mine fence, I cut him off to ground, I sphlit him mit my knife, I vittle de Gatawba cion mit my knife like a vedge, and put him in. Where wild grep he big enough, I put in two Gatawbas, pack to pack. I vind him shtrong mit a string, den I cover him mit wax. I get 20, 30, 50, 60 pounds goot, rich Gatawbas from one vine. Den grasshopper come, he eat him up. I dry him again, and he do shust de same. I get 30, 40 pounds fine, pig, rich Gatawbas from one vine. I dry some more pime-py." This gentleman is perfectly reliable, and his name will be given if any one wishes to correspond with him in German. I understood the method described, to have been the old, common method of cleft-grafting, and see no reason why any style of grafting, if carefully done, should not be followed by as good results. I have heard of several other cases of grafting the Catawba, Concord and other varieties upon the wild grape, that were perfectly successful. It has already been proposed by some that great numbers of the wild grape-vines along our creeks and rivers shall be grafted with choice varieties and left to flourish "*pro bono publico.*" Whatever may be thought of it or come of it, the field for your experiments is broad and easy of access, the amount of material unlimited, and the object aimed at entirely worthy and commendable.

VALUABLE SEEDLING APPLES.—Quite a large number of fruit-growers in this and Wabaunsee counties have valuable seedling apples, for which they desire this Society to furnish names. Mr. H. N. Williams, of Ashland, has a tree that bears very fine, large, rich summer apples, acid, red; esteems it superior to the Early Harvest; believes it a seedling; desires a name. Mr. Henry Marshall, of Deep Creek, has two or three varieties of seedlings, winter in season; size medium; fair, firm, acid, rich; long keepers; desires names for them. Many others have valuable seedling apples and peaches; but I cannot mention them. Should the Society extend an invitation for correspondence, it might result in making some valuable additions to the list of Kansas fruits.

A WILD PURPLE PLUM.—On School creek and the head of Deep creek, I heard of a valuable purple wild plum. I made careful investigation, and found that the many descriptions of the plum agreed substantially in regard to its great value. It is described as very large, rich, purple bloom, very juicy and delicious, no strong or acrid flavor, good under every treatment — fresh from the tree, cooked, dried, or canned. The tree is a profuse bearer, and the fruit is seldom stung by insects. Having an opportunity to visit the haunts of the wild beauty, I carefully removed a dozen small trees and presented them to Capt. Todd. In due time I believe your worthy secretary will have the pleasure of introducing a new and very valuable variety of plum, named "*Todd's Purple Imperial.*"

Blackberries and Gooseberries. — A gentleman at the head of McDowell creek, in Davis county, has two large patches of wild blackberries. He allows the bushes to grow at will — self-sustaining, and self-mulching. The variety is a profuse bearer; berries large, firm, and rich. Very many persons say the wild gooseberries of Kansas are good for nothing. This is far from being true. In several localities I have found two or more varieties that are excellent. In one place I had the pleasure of eating one variety, served as sauce, and in pies, and I thought them very fine. My taste may be depraved, but I prefer them to the Houghton. I saw them in glass cans; they were large, firm, handsome — considerably larger than the Houghtons that find their way into our markets. They may be kept in glass cans two years without perceptible loss in flavor.

Willows.—Willows do not belong among the fruit trees, but I desire to speak in praise of two varieties I have seen. One variety of yellow willow, growing along our creeks and rivers, is bright, beautiful, and graceful always. The bark on every limb and twig is smooth, and has the pleasant color and shine of Australian gold. The twigs are long and slender, and in time of foliage they sway gracefully before the lightest breeze. Another variety does not differ widely from many others in form, color of bark, etc., but may be distinguished from all others when in foliage, by the slight twist in its leaves. The effect is remarkably pleasing, in its added softness of tint and outline. I believe these two varieties of willow are worthy of places — liberal space in every gentleman's collection of shade and ornamental trees.

These notes have been extended beyond my original intention, and I close, thanking you for your courtesy and attention.

THE PEACH AND ITS ENEMIES.

BY T. C. WELLS.

The peach has not been found growing wild. It was first cultivated in southern Asia, and was probably derived from the common almond. From Asia it has been introduced into all parts of the world where the soil and climate are suitable for its growth. It may be propagated by seeds, budding, root-grafting and layering. The fruit from seedling trees is *usually* quite inferior to the budded or grafted varieties, but it is generally believed that the trees are more hardy and the blossom buds less likely to be killed by late spring frosts, and there are some varieties of seedling peaches of very good quality, that reproduce themselves, very nearly, from seed. It is a good plan to raise some of each, the natural and the budded fruit.

The peach being a very rank grower, thrives best in a deep, rich soil, and requires good cultivation, which should not be continued so late in the season, however, as to stimulate a late fall growth. It requires plenty of light and air, will not do well in the shade of other trees, and ought not to be too thickly planted. In order to have fruit of the best quality and largest size, it is often necessary to thin out the peaches before they are half grown, leaving them so that they will not touch each other when full grown. This may be done quite fast by knocking them off with a light pole, or choice varieties may be thinned by hand. To facilitate cultivation, picking the fruit, digging out the borer, etc., it is better to train the peach to a single stem for two or three feet from the ground.

The peach grower has plenty of enemies to contend with, among which may be mentioned, boys, birds, rabbits and insects. It is well to cultivate the good will of the boys, and also put a good hedge around your orchard, and if you let it grow so thick and high as to hide the fruit, there will be less temptation to trespass.

Most kinds of birds, doubtless do much more good than harm; there is one little rascal, however, that is an inveterate thief. It comes early in the spring and remains until fall, and feeds on all kinds of fruit, from strawberries to peaches. I cannot give its name, though I think it is an oriole. Its color, as near as I can describe it, is a brownish yellow, mixed with gray. It is quite small, and continually in motion, and there are a great many of them. The law forbids our shooting them, and any other way to protect ourselves from their depredations I cannot suggest. I think our bird law ought to be changed so as to allow fruit growers to destroy birds that are a real injury to them. I do not believe that this bird destroys insects enough to pay for the damage he does.

The surest way to prevent damage from rabbits is to tie something like thick paper or straw around the trunks of the trees so close and high that they will not be able to get at the bark; and also, it is well to shoot and trap all you can.

Of the various insect enemies I will notice but three—two beetles and a moth. The first beetle is the *Cetonia inda* (Harris). It is quite a large, hairy beetle, with a broad body and a rusty-black color. It eats into the best ripe peaches; sometimes eight or ten or even a dozen may be found in a single peach. They should be destroyed whenever found. The other beetle is the plum curculio, *Conotrachelus nenuphar*. Every peach grower knows the "little Turk," and how hard it is to find an early peach that does not contain one of its larvæ, unless means have been used to prevent it. Early in the season many of them may be caught under chips placed near the trees, and examined every afternoon. It has been recommended to smoke the trees with gas tar, or dust them with air-slaked lime, after every rain; but the way most usually practiced, and which has proved successful, is to jar them from the trees every morning, for several weeks after the trees have blossomed, catching them on sheets and destroying them. The moth above mentioned is the *Ægeria exitiosa* (Say), and somewhat resembles a wasp in shape. The male is of a steel-blue color, with yellow markings, and transparent wings, which it expands about an inch. The female differs from the male chiefly in being considerably larger, and in having its fore wings dark blue and opaque. The moth deposits her eggs on the bark of the tree, usually near the surface of the ground, at any time during the warm weather—say from May to October. The eggs soon hatch, and the young larvæ feed on the bark and sap wood, often completely girdling the tree. Perhaps this borer is really the worst enemy of the peach. Fifteen or twenty, or even more, may sometimes be found in a single tree. After continuing the work of destruction for nearly a year, it forms a cocoon, changes to a chrysalis, and in due time comes out a perfect moth.

The trees should be examined in spring and fall. and the borers dug out. It is a good plan to raise a mound of earth from 8 or 10 inches to 2 feet high around each tree. This will not keep out all the borers—a few may be found; but it is much more easy to get at them than when obliged to dig down among the roots to find them.

Some may think that the best way to raise peaches is to plant the trees and let them grow and take care of themselves, get what fruit you can, and, when they die, plant more trees. Let those do so who choose, but it seems to me that fruit worth raising is worth taking care of; and we all know the best fruit always brings the best price in market; indeed, fruit of a good quality can often be sold at a fair profit, when ordinary fruit will not pay for picking.

HORTICULTURE IN SWITZERLAND.

(Abstract of a paper read before the Manhattan Horticultural Society, by Prof. J. D. Walters, June 17, 1880.)

The horticulture of a country is a product of several equally important factors—climate, soil, markets, and civilization. We will consider some of these factors separately, before we inquire into their result. Switzerland is in the latitude of Minnesota, and is a high table-land, bounded on the south by the Alps, and on the north and west by the Jura mountains. It will be seen at once that the Swiss horticulturist cannot dine on oranges, unless he buys them from his southern neighbors in sunny Italy. In the Alps, nothing can be raised that would taste like vegetables. Pastures on the slopes, pines among the rocks, snow on the peaks and glaciers in the gorges, are the programme. In the Jura, the lower valleys produce potatoes and cabbage, while higher up an occasional walnut tree, lonesome among the shaggy pines, ripens his scanty fruit. There are in French Switzerland well-populated towns—I name La chaux de Fonds and Locle—about which, for a dozen miles, not an onion can be grown.

But as we descend the valleys the vegetation changes. We behold a land like Kentucky, rather than Minnesota. The hills are covered with dense woods of oak, beech, Austrian pine, and wild cherry. The streams are lined with meadows, the slopes bear wheat and potatoes, while the hills facing south are terraced up, and sun the delicious grape.

Considering the elevation of the country and its latitude, the climate is very favorable for agriculture and fruit raising. It is thus all over central Europe. The gulf stream warms the northern coast of the continent, while hot Africa sends warm winds from the south; and these south winds—*fœhns,* as the Swiss call them—are not disgusting exodusters from the sandy plains of Mexico, but are warm, moist, delightful Kansas zephyrs (?). A glance on the map will show that these winds must pass the Mediterranean, which classical pond acts in more than one way as the great balance wheel of Europe's climate.

Geologists tell us that for ages after the Alps and Jura had dared to raise their venerable heads, the encircled country was the bed of a sweet-water lake. They tell us, too, that at that time it rained often and in torrents. Thus, valleys and gorges were torn out in the body of the mountains, and the basin of the lake filled with the debris. Dig in the plateau wherever you please, you will find such subsoil, often cemented together, but oftener loose and bouldery, sometimes intercepted by strata slate, but oftener by a kind of porous limestone interwoven with fish and reptile bones. Artesian wells can, as a consequence, be bored anywhere. Just drill, and the "liquid gold" will spout. The country is dotted with lakes fed by innumerable springs and rivers; and where there is no lack of water, deep soil, a good climate, plenty of snow in the winter, and timber in abundance, there can be gardens and fields.

All the land is not rich, of course. Tilled since Julius Cæsar, much of its original fertility has vanished, and the only salvation for such land is plenty of manure. But the Swiss takes care of every morsel. You can see the gardener's son run out on the highway to gather up horse droppings, before the animal has trotted out of sight. For the last twenty years, factories of artificial fertilizers have sprung up in the suburbs of larger towns, and market gardeners are importing guano from Chili. An immense amount of underdraining with tile-pipes has been done also in the last half-century.

The markets of central Europe are everything the gardener could reasonably wish. A dense population, averaging two hundred inhabitants per square mile of land not covered by water or everlasting snow, requires all the food that can be produced. The import of food substances in Switzerland is equal to about eight per cent. of the home production. That large farms cannot exist under such circumstances, is self-evident. The town suburbs are cut up into small garden properties of two, five or eight acres. Further out, there are farms of ten, twenty or perhaps, at intervals, of forty acres, but very few larger ones. These farms contain no woodland, however. All woods, and these are not inconsiderable, belong to the Government, which husbands them carefully. All timber is planted like corn with us, and cultivated until it reaches the height of four or six feet. It is then thinned out, trimmed up, and when mature cut down. Timber is cut *tabula rasa* as far as the forester, an important officer in timber husbandry, drives his stakes. The stumps are then dug up, the ground plowed and planted to potatoes for one year, and then timbered again. All timber which I have seen planted was white, red, or Austrian pine. On the mountain-sides this method could not be followed. The soil would wash and slide, and snow avalanches would destroy the lower timber-belts and carry destruction into the valleys. On such slopes, trees are cut sparingly; and in dangerous places laws forbid the cutting of any.

Districts blessed with exceptionally good soil and other favorable factors, have the appearance of vegetable gardens. These Edens supply the mountain towns mentioned with greens. Why, in the name of common sense, these towns were built where they are, I do not know, unless it is because the lots were cheap, building material in abundance, water-power plenty, air fresh and cool, and the people determined. They live by watchmaking there. All make watches, talk watches, trade watches, and know all about watches. In other districts they make ribbon; in others, again, jewelry. Money is plenty when times are good; if bad, the Lord and the Government provide. If garden lands could be bought at reasonable prices, I would want to be a Swiss horticulturist; but wild pasture land in the mountains is worth $15 per acre, farm land sells for $200, and garden grounds as high as $500, with no chance to sponge pasturage on highways and commons for the smallest Jersey beast. In my native town there is not a rod of fence of any kind, save a few neatly-trimmed hedges for ornamental purposes. Debts are the ruin of a man there as well as here, and so the poor man must rent a place and be a slave, or come to Kansas.

Of the vegetables raised, the Irish potato is the king. It is planted and worked as everywhere, generally gives good crops, and ornaments the table of rich and poor. A portion of them are transformed into liquors, alcohol, starch, or used as pig feed. Cabbage is raised by the acre. The plants are set out with much care, and fertilized several times during the summer with liquid manure. The great bulk of the cabbage goes into barrels to ferment into classic *sauerkraut*. String beans, peas, red beets, lettuce, etc., form the usual programme of every kitchen garden. Strawberries grow in the woods, as well as in the market gardens; and the same is true of gooseberries, blackberries and raspberries. Currants bear well, but the "boss" shrub is the grape-vine.

The importance of grape culture will be evident from the statement that in the canton of Geneva four per cent., and in the cantons of Vaud, Neuchatel, Zurich and Thurgau two per cent. of the grand total area is covered with wine plantages. The best location for a vineyard is the southern foot-slope of a hill, especially along sun-reflecting waters. The ground is held in place by terrace walls of roughly-cut stone, and the vines are grown about five feet apart on pine poles, the extremities of which have been boiled a few moments in coal tar. With us in Kansas, terrace vineyards would not do. Switzerland records 40 foggy and 150 rainy days, against the 4 thin fogs and 102 splashing rains which our meteorologists are permitted to enjoy.

Grape raising is hard work. The plow and cultivator are not used; all is done with hoe and spade. The plantages are kept scrupulously clean of weeds. As much manure is used as can be made. It is carried up the terraces in back baskets. The grapes are carried down in similar baskets. The varieties planted are not numerous, and mostly of a yellow, transparent color. The plants are raised in nurseries, and transplanted when three or four years old. Cutting is done so short that, in the winter, when the poles are removed to sheds, strangers often wonder what the stub-fields contain.

Some grapes are dried and sold as raisins; others are jellied, or preserved for winter use; but the great bulk of them go to the press — not the printing press. The canton of Vaud alone produces over ten million gallons of the sparkling liquid "that gladdens the human heart," as the Hebrew sage put it. Yet, notwithstanding these enormous productions, the country imports one million francs' worth of spirituous beverages per annum. A necessary consequence of this is, the liberal use of wine in the family. In the wine-producing cantons, it visits the table as regularly as milk. Everybody drinks wine; and, curiously enough, they are healthy, act vigorous, and get old. Swiss wines seem to contain less alcohol and more sugar than our Missouri or California productions. They are kept unadulterated and pure, which may explain something.

Experiments have been made of late with the tomato, as a substitute for the grape, so furiously attacked for the past five or ten years by the phylloxera, and if what I have read is true, they have been successful. Tomato wine is said to contain a smaller percentage of alcohol, more nourishing substances, if bottled, a greater amount of carbonic acid gas, than ordinary grape wine.

If horticulture in Switzerland can supply the demands of the country in any line, it is in products of the orchard. Apples, pears, cherries, prunes and plums grow in abundance, but the peach is not found extensively. The roads and railroads are lined for miles with oak-like fruit trees — kings, every one of them. Of all kinds of fruit, the pear is the peer. There are dozens of varieties with names and dozens without names — seedlings and grafted ones. Most of them are large, hard winter pears that cannot be eaten before Christmas. These winter varieties make the best cider, too. Many of the fall varieties ferment partly on the tree, and must be used as soon as they drop. I have eaten pears in Leavenworth and Lawrence which were better, finer and nicer specimens than any that I ever tasted in Switzerland; but I have never seen in America orchards full of trees loaded down with fruit like those. The canton of Thurgau is perhaps the best pear country in the world, with Zurich and Aargau following.

Most every farmer has a small nursery in a corner of his garden, where he raises and grafts his own trees; or one neighbor, more of an expert in the art, grafts for the other. Young men learn the art early. The school books contain chapters on fruit raising and grafting, and many of the cantons have agricultural schools and experimental stations. Thurgau, with a population of 90,100, has an industrial college, an agricultural school and three experimental farms, managed by the State. Other cantons, however, do nothing at all for the rural arts.

Time forbids to speak of the most charming branch of our beloved art—landscape gardening. It will be the subject of another paper. Few countries can boast of natural beauty—of grand, sublime scenery—like Alpine highlands; and where a tasteful hand aids a willing nature, there can well be charm for the eye. Let me quote one passage from "A Kansan Abroad." He stands on the Brunig, in the Bernese highlands, and exclaims: "Everything I saw in dreams of lofty mountains; of 'airy pinnacles that syllable men's names;' of cataracts, bounding in snowy whiteness into mid-air, and passing away in rainbow-tinted mist; everything I ever saw on canvas of flying clouds or azure sky; everything I imagined in waking hours, of forest, dale or stream, is here."

The old parks in the suburbs of towns and monasteries have an aristocratic look—stiff, straight, and shorn—rococo from the gate to the chapel. The trees are gigantic linden, oaks, and Lombardy poplars. Modern villas are surrounded by English parks—natural, interesting and ever changing in aspect. The fashionable trees at present are the horse chestnut, the platana, and the beech. Nothing can be more delightful than a summer-day ramble among the beeches, which, interspersed by an occasional oak giant, constitute the parks of many of the old castles and modern villas of the country. The shadows are so cool and deep; the belts of golden light that lie across the greensward at every opening among the trees, are so bright and sunny; the far-stretching vistas, so mysterious and seductive to the imagination; and the trunks and branches of the beeches, so round and well filled, and so covered with heavy masses of light-green foliage—that one feels as if in an enchanted palace of some Arabian prince.

But I must close. I should have mentioned many other subjects, to make the picture even an outline. I should have spoken of the May-bug, and of its progenitor, and might have told you how, in olden times, he was summoned before the bishop of Lausanne, damned, and sentenced to leave the country, and how he decided to stay, notwithstanding. I should have mentioned that apple borers are worse over there than here, and that the cabbage worm and the phylloxera increase in their attacks upon the products of hoe and plow with more fury every year. I have not said anything of taxes, a worse affliction than grasshoppers, chinch and potato bugs, every time.

Every country has its dark side, and so has Kansas; but we do not hear of Kansans going abroad to stay. The fact that the United States has issued citizen papers to a half-million of Swiss, tells a story. I know one chapter of it. It begins in an over-populated country town, tells of petty laws, military duties, high taxes, small wages, hard work and no hope, and ends on the broad prairies of Kansas, with liberty, plenty of space, plenty to live on, and a bright future.

MONTGOMERY COUNTY HORTICULTURAL SOCIETY.

(Organized March 20, 1877.)

REPORTED BY THE SECRETARY.

The following is a list of officers for 1881:

President—Judge Turner, Independence.

Vice President—Judge Harrison, Independence.

Treasurer—Thomas Overfield, Drum Creek township.

Secretary—L. A. Walker, Independence.

The following standing committees are annually appointed by the President: On Orchards, Vegetable Gardening, Small Fruits, Tree Planting and Hedges, Floriculture, Entomology, Nomenclature, Lectures and Essays.

HORTICULTURAL NOTES FOR 1880, BY THE SECRETARY.

The year 1880, just closed, was a propitious one—not in the abundance of all that the planter might desire, but of many varieties a profusion, many a sufficiency, some short—yet especially gratifying in the products of the young orchards of Montgomery county. Of pears, peaches, apples and grapes, there was enough to justify us in our anticipations, giving the promise of future results, just in proportion as our good judgment and good cultivation may invite.

We may safely affirm that fruits of all kinds in Montgomery are at home, samples of which during the past season were exhibited abroad and at home, receiving creditable notice.

At the annual meeting for 1880, it was ordered that the organization should meet at convenient locations throughout the county during the year, commencing with the month of May, which course was pursued, and proved to be a pleasant and popular arrangement, and will be followed up during the coming year.

The prestige attained by the quality of peaches, grapes and vegetables shipped and sold in other markets in the late previous years has been of advantage during the past season. From among the orchards now planted there was more than sufficient for home use, and the surplus found a ready market abroad. An inquiry into the amount of shipments for 1880 was made, and reported as follows:

The shipments of peaches, strawberries, vegetables, etc., reached the large amount of 53,000 pounds. Of this amount, it is estimated that fully 15 tons were peaches; grapes probably amounted to 10,000 pounds; while the remainder was made up of lettuce, radishes, onions, peas, cucumbers and other vegetables.

Our fruits reached the markets of Yankton, Dak., Omaha, Pueblo, Las Vegas, and elsewhere, and orders came for more. Our vegetables were in demand from all Western points (far greater than the supply), and the fragrant onion was eagerly sought for in the mountain camps of Colorado and New Mexico. We may be permitted to add that we see a bright future for the fruit and vegetable growers of Montgomery county. We believe that the demand will constantly increase, so as to insure more remunerative prices. When the supply shall increase to a car-load daily, then will high rates of expressage disappear, to the advantage of producers and consumers.

We urge upon all, the planting of more small fruits for home consumption and for shipment.

MORRIS COUNTY HORTICULTURAL SOCIETY.

(Organized October 25, 1880.)

REPORTED BY F. B. HARRIS, SECRETARY.

The following are the officers for 1881:
President—Crawford Kear, Parkerville.
Vice President—Wm. Downing, Council Grove.
Secretary—F. B. Harris, White City.
Treasurer—S. McCullough, Grand View.

Our first meeting was held in the floral hall of the Parkerville Agricultural Fair, September 23d, 1880. A few responded to the call, among whom were S. McCullough, C. Kear, A. J. Hughes, J. Whitaker, L. McKenzie, J. E. Reagan, F. B. Harris, and Miss Lida Burgoyne.

A committee was appointed to solicit an interest in the organization of a horticultural society.

The second meeting was held October 6th, 1880, on the grounds of Council Grove Agricultural Society, during its fair. The officers recorded at the head of this were elected.

A committee was appointed to draft a constitution and by-laws, consisting of the following members: C. Kear, A. J. Hughes, S. McCullough, and F. B. Harris, and were instructed to report at the next meeting.

Adjourned, to meet October 25, at Council Grove.

Meeting held at the court house in Council Grove, October 25th, was called to order by the President, who, with several others, opened the exercises with stirring remarks upon the object for which the Society had been organized.

The committee on constitution and by-laws reported the following

CONSTITUTION.

ARTICLE 1. This association shall be known as the Morris County Horticultural Society.

Art. 2. Its object shall be to coöperate with the State Horticultural Society, and also obtain useful information from its members, and similar organizations, upon the subjects of horticulture and agriculture, and to disseminate such information among the people of the county as far as practicable.

Art. 3. Its members shall consist of persons paying a fee of twenty-five cents annually, commencing at the first annual meeting of the Society, excepting ladies, who are admitted free.

Art. 4. Its officers shall consist of a president, vice president, secretary, and treasurer, who shall be elected by ballot at each annual meeting, and shall hold their respective offices for the term one year, or until their successors shall be elected. The president, as soon as elected, shall appoint one vice president in each township of the county for the ensuing year, whose duty it shall be to report to the Society, at each annual meeting, on the subject of fruit culture, and to look after its interests in their respective townships.

Art. 5. The Society shall hold an annual meeting on the Tuesday preceding Thanksgiving day, in November; and a semi-annual meeting on the first Tuesday in June; and special meetings may be called at any time when the president and secretary may deem it necessary.

Art. 6. It shall provide at each annual meeting a committee of one in each of the following branches of horticulture: 1st, on Orchards; 2d, Vegetable Gardening; 3d, Small Fruits; 4th, Forestry and Hedges; 5th, Floriculture; 6th, Entomology; 7th, Vineyards. Said committees are required to report at each regular meeting.

Art. 7. This constitution may be altered or amended at any regular meeting, by a two-thirds vote of the members present.

BY-LAWS.

The following shall be the order of exercises: 1st, Reading minutes of previous meeting; 2d, Communications and correspondence, with short discussions; 3d, Reports of committees on branches of horticulture, with short discussions, if desired; 4th, Reports of special committees; 5th, Miscellaneous and new business; 6th, General discussions.

On motion, the constitution and by-laws reported by the committee were adopted, and signed by those present.

The President appointed Township Vice Presidents as follows: Neosho township, William Downing, Council Grove; Highland township, N. Ralay, Grandview; Rolling Prairie township, H. Binnian, White City; Council Grove township, J. Barth, Council Grove; Diamond Valley township, J. W. Evans, Diamond Springs; Parker township, C. P. Sommers, Parkerville; Warren township, A. Dean, Council Grove; Valley township, J. Routledge, Dunlap; Clark's Creek township, J. Morris, White City; Ohio township, D. Brooks, Parkerville; Elm Creek township, J. P. Stover, Council Grove.

Committees on branches of horticulture were appointed as follows: On

Orchards, F. B. Harris, White City; on Vegetable Gardening, T. Myres, Parkerville; on Small Fruits, C. Kear, Parkerville; on Forestry and Hedges, F. M. Wireman, Council Grove; on Floriculture, Miss Lida Burgoyne, Parkerville; on Entomology, J. E. Reagan, Parkerville; on Vineyards, Frederick Feigley, Council Grove; D. Brooks, Parkerville, was appointed as Committee on Meteorology, and to report at the next meeting its practicability in connection with horticulture.

The first annual meeting was called and held in the court house, in Council Grove, on Tuesday, November 23, 1880. The inclemency of the weather prevented a full attendance, and no business was transacted.

On motion, the officers and committees were continued for another year.

NEMAHA COUNTY HORTICULTURAL SOCIETY.

(Organized February 5, 1881.)

REPORTED BY THE SECRETARY.

Officers for 1881:

President—S. J. Edgerly, Seneca.
Vice President—N. Coleman, Oneida.
Secretary—George Hay, Seneca.
Treasurer—G. R. Benedict, Seneca.

CONSTITUTION.

ARTICLE 1. This association shall be known as the Nemaha County Horticultural Society.

ART. 2. Its object shall be, to obtain useful information from similar organizations and from other sources, upon the subjects of horticulture and agriculture, and to disseminate such information among the people.

ART. 3. Any person may become a member of this Society by paying a fee of one dollar annually. Ladies may become honorary members, free.

ART. 4. Its officers shall consist of a president, vice president, secretary, treasurer, and librarian, who shall be elected at each annual meeting of the Society by ballot, and hold their term of office for one year, or until their successors are elected.

ART. 5. It shall hold an annual meeting on the first Saturday of December, and a semi-annual meeting on the first Saturday in June.

ART. 6. It shall provide, as soon as possible, a library, and add thereto such books and publications as shall be deemed expedient for the use of the Society.

ART. 7. It shall provide at each annual meeting, standing committees of one person each, who shall be appointed by the president. These committees shall be as follows: 1st, on Orchards; 2d, Vegetable Gardening; 3d, Small

Fruits; 4th, Forestry and Hedges; 5th, Floriculture; 6th, Entomology; 7th, Nomenclature; 8th, Essays and Lectures. Said committees are requested to report at each regular meeting, or oftener if necessary.

Art. 8. This constitution may be altered and amended at any regular meeting, by a vote of two-thirds of the members present, but no business shall be transacted when less than a quorum is present.

Art. 9. Seven members shall constitute a quorum. A less number may adjourn.

Art. 10. The annual and semi-annual meetings shall be held at Seneca, but monthly meetings may be held at the residences of members or other persons, for the purpose of studying the results of methods in practice, as illustrated in the orchard, vineyard, or garden.

BY-LAWS.

The following shall be the general order of exercises at meetings: 1st, Reading minutes of previous meeting; 2d, Communications; 3d, Reports from standing committees; 4th, Reports from special committees; 5th, Miscellaneous business; 6th, General discussions.

These by-laws may be altered or amended by a two-thirds vote of the members present at any regular meeting.

At the meeting held February 19, 1881, President Edgerly called the meeting to order.

Minutes of previous meeting were read.

At this meeting, the subject of a preferred apple list for northern Kansas was discussed. The most important points brought out were the following: That the Willow Twig was subject to blight of late years; Winesap and Rawles Genet were the two most profitable varieties; the Bellflower was very unproductive; the Northern Spy, tree hardy, a late and shy bearer, fruit inclined to scab, and inferior; Rambo, a good keeper, if gathered early and properly stored; King of Tompkins County, shy bearer, fruit rather inferior.

The members of the Society are active, and fully sensible of the usefulness of such an organization when intelligently managed.

OSBORNE COUNTY HORTICULTURAL SOCIETY.

(Organized March 12, 1881.)

REPORTED BY THE SECRETARY.

Officers for 1881:

President—M. Mohler, Osborne.

Vice President—D. C. Bleam.

Secretary—W. G. Short, Twin Creek.

Treasurer—E. B. Rathbun, Corinth.

Librarian—Z. T. Walrond, Osborne.

Executive Committee—W. F. Cochrane, A. W. Gowan, Osborne; and Messrs. Judson, Linden and Bristow.

Standing Committees—Nomenclature, E. C. Frear; Entomology, V. M. Noble; Orchards, D. C. Bleam; Small Fruits, S. H. Alexander; Vegetables, Judson Linden; Forestry, D. Brobst; Hedges, John M. Byrd, Floriculture, Mrs. P. Gillett; Quadrupeds, C. M. Bliss.

Number of members enrolled, 44.

PROCEEDINGS OF A MEETING HELD FEBRUARY 26, 1881.

The President called the meeting to order at 1 o'clock P. M. on the above date. The minutes of the last meeting were read and approved.

The committee on constitution and by-laws reported the following, which were adopted:

CONSTITUTION.

ARTICLE 1. This association shall be known as the Osborne County Horticultural Society.

ART. 2. Its object shall be to obtain useful information from similar organizations and other sources upon the subjects of horticulture and agriculture, and disseminate such information among the people as far as practicable.

ART. 3. Its membership shall consist of members paying a fee of twenty-five cents annually, commencing at the first annual meeting, excepting ladies, who are admitted free.

ART. 4. Its officers shall consist of a president, vice president, secretary, treasurer, and librarian, and an executive committee of three, who shall be elected at each annual meeting by ballot, and shall hold their office for the term of one year, or until their successors are elected.

ART. 5. It shall hold an annual meeting on the second Saturday in March, and a semi-annual meeting on the second Saturday in September, and at any other time the president and executive committee may deem it necessary.

ART. 6. It shall provide (as soon as practicable) a library, and add books and publications for the use of the Society.

ART. 7. It shall provide, at each annual meeting, a standing committee of one person, to be appointed by the president: 1st, on Orchards; 2d, Vegetable Gardening; 3d, Small Fruits; 4th, Forestry and Hedges; 5th, Floriculture; 6th, Entomology; 7th, Nomenclature; 8th, Quadrupeds. The said committee are required to report at each regular meeting, and oftener if it be deemed necessary.

ART. 8. This constitution may be altered or amended at any regular meeting, by a two-thirds vote of the members present.

BY-LAWS.

The following shall be the order of exercises for the Society: 1st, Reading of minutes of previous meetings; 2d, Communications and correspondence; 3d, Reports of standing committees; 4th, Reports from special committees; 5th, Miscellaneous business; 6th, General discussions.

The question of hedge growing was then taken up.

Mr. Mohler said he believed every man in this county could have a good hedge fence. He could grow a mile of hedge as cheaply as a mile of corn. Had three miles of hedge on his farm, and all that portion of it that was set with large plants would turn all kinds of stock in another year. Never would set small plants, as they never did well; many of them died out, and success in resetting is attended with a great deal of labor. He recommended growing plants in the nursery and not in the hedge-row, as you can thus avoid having small plants in the hedge-row. He urged the necessity of hedge growing as early as possible by every farmer.

Mr. Linden asked for information in regard to the preparation of seed for planting. Mr. Cochran would place the seed in a gunny-sack, and sink it in running water, and let it remain until sprouted, which will take three or four weeks. This plan was recommended by Messrs. Mohler, Byrd, McKay, and others.

Mr. McKay planted three-quarters of a mile in 1875; mulched the hedge-rows and cut down the second year after planting. Would recommend transplanting from the nursery.

Mr. Rathbun thought the honey locust would succeed better than Osage, as the grasshoppers would not eat them, and they grow more rapidly.

David Milne said he had a high opinion of the locust, as a fence; had seen fences of it in eastern Kansas, and that it made a good fence.

Dan. Brobst planted honey-locust seed in 1875, and had trees now with limbs fifteen feet long.

John M. Byrd had experience in Missouri in Osage orange growing; believed that it would do well in Kansas; recommended transplanting from the nursery; plant twelve inches apart, so as to give room for future growth, and when two years old, bend down and weave together; would not cut the stock to bend it, as it retards the growth of the trunk of the tree.

For tree culture, **Mr. Bleam** would refer the association to the farm of Jerry Quigley, in the western portion of the county, who has walnut trees of only six years' growth now bearing fruit. Thought no tree should be transplanted until the sap was up.

Mr. Milne has three miles of cottonwood trees, and they needed cultivation every year or they would die out; recommended walnut as the best tree for planting; grows slowly for four or five years, after that grows rapidly; next to the walnut, he would plant red elm; next, hackberry. This opinion was entertained by many others.

The Society then adjourned to meet on the 12th day of March, when permanent officers will be elected for the ensuing year. The question of small-fruit culture will then be discussed.

The time has come when the subject of tree-growing should receive the careful attention of every citizen of the county, and the advantages to be derived from being in communication with the State Horticultural Society are desirable. Every person who contemplates planting a tree this spring is invited to attend the meetings.

PAWNEE COUNTY HORTICULTURAL SOCIETY.

(Organized March 28, 1877.)

REPORTED BY THE SECRETARY.

Officers for 1881:
President—J. F. Hursh, Garfield.
Vice President—Henry Pratt, Larned.
Secretary—C. C. Chevalier, Garfield.
Treasurer—J. M. Frizell, Garfield.
Librarian—G. W. Stone, Garfield.

The fourth annual meeting of the Society was held in the M. E. Church, February 5, 1881. Henry Pratt was called to preside.

Minutes of previous meeting, were read and approved.

Forestry culture was discussed, and resulted in bringing out the following points: The peculiar conditions of climate during the past two years place the ailantus tree at the head of the list; following it in the order named, the honey locust, ash-leafed maple, and cottonwood. Experience favors close planting, in rows not to exceed eight feet apart, and from two to four feet in the row. Growing crops should be sheltered on the south during summer, and are an advantage on the north during winter.

On motion, the constitution was amended so as to fix the time of the annual meeting on the first Saturday in February, and the semi-annual meeting on the first Saturday in August.

POTTAWATOMIE COUNTY HORTICULTURAL SOCIETY.

(Organized January 31, 1880.)

REPORTED BY THE SECRETARY.

Officers for 1881:
President—H. W. Shove, Havensville.
Vice President—Sam. Taylor, Havensville.
Secretary—Jos. Leach, Havensville.
Treasurer—S. D. Beach, Burks Grove.
Meetings are held monthly.

RENO COUNTY HORTICULTURAL SOCIETY.

REPORTED BY THE SECRETARY.

Officers for 1881:

President—L. Houk, Hutchinson.

Vice President—A. M. Switzer, Hutchinson.

Secretary—L. J. Templin, Hutchinson.

Treasurer—C. L. Easley, Hutchinson.

Executive Committee—L. Houk, L. J. Templin, A. S. Dimock, C. H. Longstreth, S. F. Traft.

The Society annually appoints a fruit committee of one from each township in the county, whose duty it is to report to the Society, from time to time, the condition and prospects of the horticultural interests in their respective districts.

This Society was favored with the privilege of entertaining the State Horticultural Society, during its tenth semi-annual meeting, June 1–3, 1880. Not only were the members of this Society and the citizens of Hutchinson, who were permitted to attend, highly pleased, but greatly benefited by its sessions.

RICE COUNTY HORTICULTURAL SOCIETY.

(Organized November 5, 1877.)

REPORTED BY THE SECRETARY.

Officers for 1881:

President—J. B. Schlichter, Sterling.

Vice President—Wm. Q. Elliott, Sterling.

Secretary—J. H. Stubbs, Sterling.

Treasurer—Sam. B. Hampton, Sterling.

Meetings are held semi-annually, in June and October.

SALINE COUNTY HORTICULTURAL SOCIETY.

(Organized December 15, 1877.)

REPORTED BY THE SECRETARY.

Officers for 1881:

President—Robert Anderson, Salina.

Vice President—U. S. Hall, Salina.

Secretary—R. H. Bishop, Salina.

Treasurer—B. B. Stimmell, Salina.

Meetings are held at call of the President.

WABAUNSEE COUNTY HORTICULTURAL SOCIETY.

(Organized December 23, 1875.)

REPORTED BY THE SECRETARY.

Officers for 1881:
President—Abner Allen, Wabaunsee.
Secretary—H. A. Stiles, Pavilion.

The meetings are held monthly, at the residences of its members. The growth of this Society has been healthy. Step by step has it advanced. The members were fully conscious of their ignorance of the methods required in Kansas. A few were informed as to successful methods in the Eastern States, but soon discovered their non-adaptation to the conditions governing here. It became evident that the proper means to develop horticulture successfully, had to be determined by persistent efforts and experiences peculiarly applicable to the locality. The means at command for the work were meager and experiences were very limited; yet the members were not discouraged. They met year after year; compared notes; discussed methods suggested; and secured the assistance of Professors of the Horticultural Department at the Agricultural College. Slowly the accumulated knowledge began to diffuse light upon the new field of exploration. The published annual reports of the State Horticultural Society, distributed among its members, have accomplished more than any other agency in developing an interest in fruit growing. These volumes furnished the practical workings and experiences of successful orchardists in our State, and were to the members valuable aids in ascending the eminence of horticulture. Thus, with our own experience and observations, assisted by that of others in this State, we have reached results which afford success, and encourage further efforts in the future.

What to plant, how and when, have been satisfactorily determined. Experiments to reach such knowledge have been expensive, as, being governed in the selections for the first plantings by the knowledge obtained in Eastern States, these selections have proven largely failures, owing to non-adaptation to the climate of the State. Had those selections been made on the basis of what is now known, the results would have been not only successful, but a hundred per cent. more valuable in point of profit.

The subject of pruning has been fully considered in the meetings of this Society, and its importance conceded. No orchardist can safely proceed without at least practicing it to some extent. At no time has its necessity been more fully forced on the mind than during a recent visit of this reporter to the orchards in western New York, the great fruit section of the Union. There the land is valuable, and to utilize all available space, they train the trees high. The fruit of those orchards can only be reached by long ladders, and the system of high heads by pruning already bears marks of a most injurious character in the decay already apparent. Pruning has been practically illustrated before the Society, and though some may fail to profit therefrom, yet many orchards will demonstrate its necessity and its benefits in the future.

Not all the benefits of this Society are confined alone to fruit culture. The social faculties of our nature have been strengthened and developed. The wives of members are generally in attendance, and add much to the interest and enjoyment of the meetings.

The Society organized with ten members; its membership now numbers nearly fifty, and thousands of trees, plants, etc., are now growing on the farms of settlers in this and other counties, and may well be called the monuments of this and other horticultural societies' usefulness. May their good work continue and extend, until Kansas shall be noted for the beauty of its horticultural adornments, and the blessings attending a high development of its horticultural resources.

WASHINGTON COUNTY HORTICULTURAL SOCIETY.

(Organized April 3, 1880.)

REPORTED BY THE SECRETARY.

Officers for 1881:
President—Dr. Chas. Williamson, Washington.
Vice President—G. W. Williamson, Washington.
Secretary—E. J. Nason, Washington.
Treasurer—Wm. Cummins, Washington.
Trustees—Wm. Nemils, Wm. Bullemore, and E. J. Weekly.

Meetings are held semi-annually, in June and October.

WAVELAND HORTICULTURAL SOCIETY, OF OSAGE COUNTY.

(Organized March 26, 1881.)

REPORTED BY THE SECRETARY.

Officers for 1881:
President—John J. Dietrich, Carbondale.
Vice President—E. J. Clark, Waveland.
Secretary—H. O. Smith, Carbondale.
Treasurer—Wm. Vanderlip, Carbondale.

CONSTITUTION.

ARTICLE 1. This association shall be known as the Waveland Horticultural Society, of Osage county.

ART. 2. Its objects, the advancement of the science and art of horticulture.

ART. 3. Its membership shall consist of annual members, paying an annual fee of twenty-five cents. Ladies to become members by simply giving their names to the secretary of the Society.

ART. 4. Its officers shall consist of a president, vice president, secretary, and treasurer.

ART. 5. It shall hold its regular meetings on the first Saturday of each month. The meeting on the first Saturday of January, to be known as the annual meeting.

ART. 6. This constitution may be amended at any regular meeting of the Society, by a two-thirds vote of the members present, providing notice has been given at the monthly meeting previous.

ORDER OF BUSINESS.

1st, Reading of minutes of previous meeting; 2d, Communications and correspondence; 3d, Reports from standing committees; 4th, Reports from special committees; 5th, Miscellaneous business; 6th, General discussions.

WYANDOTTE COUNTY HORTICULTURAL SOCIETY.

(Organized August 10, 1878.)

REPORTED BY THE SECRETARY.

Officers for 1881:

President—W. W. Dickinson, Wyandotte.
Vice President—Geo. L. Kroh, Wyandotte.
Secretary—M. B. Newman, Wyandotte.
Treasurer—Josiah Miller, Wyandotte.

Meetings are held at the call of the President.

EXHIBITION OF FRUITS,

Made during the Western National Fair, at Bismarck Grove, September 13-18, 1880.

This exhibition was made at the request of the Board of the Western National Fair Association. The selection of space in which to arrange the collection was granted the Society, and was located on the second floor of the east wing of the main Exposition building and a portion of the north wing. The display contained 1,200 plates of apples, 80 plates of pears, 40 plates of peaches, 40 plates of grapes, 14 plates of plums, 20 plates of crabs, and 51 plates of promising seedling/apples of Kansas origin; also, 38 pyramidal fruit stands of pears, peach, quinces and grapes.

The collection was a gratuitous offering to promote the interest and success of the fair, and was not entered in competition for any premium. It was made up by the free contribution of the following fruit growers, to whose kindness and unhesitating liberality is due the grateful recognition of the State Horticultural Society, the Western National Fair Association, and the State at large:

CONTRIBUTORS.

J. G. Clark, A. P. Scott, Waveland; C. G. Wickersham, John Collins, Parsons; Stubbs and Coates, ———; Wm. Cutter, Junction City; Abner Allen, Wabaunsee; H. A. Stiles, Pavilion; E. J. Holman, Leavenworth.

Lyon County—M. W. Phillips, O. Lambert, J. V. Randolph.

Bourbon County Horticultural Society—J. D. Manlove, A. Shinn, J. Q. Merryman.

Jackson County Horticultural Society—By John McCreary, R. P. Hamm, Jos. Cook, Thos. Kier, Fred. West, C. Pope, A. J. Turner, D. Blosser, J. Thornburgh.

Cowley County Horticultural Society—By S. E. Maxwell, R. G. Hogue.

Johnson County Horticultural Society—By H. Perley, E. P. Diehl, Wm. Maxwell, E. H. Ainsworth.

Douglas County—Miss M. L. May, L. Bryant, O. H. Ayer, Sidney Johnson, Geo. Y. Johnson, Geo. C. Brooks, P. Carter, H. S. Carmean, A. Kostenbader, Dr. A. Williams, Frank Chadwick, Wm. Kohler, Wm. Gardner, N. Henshaw, Mrs. Jas. Garrett, Sam. Baker, A. Getsker, J. P. Kendall, C. M. Sears, D. G. Watt, John Pardee, Sam. Reynolds, C. Wicks, Thos. Crowder, H. S. Smith, Wm. C. McClintock, James Seaton, J. J. McGhee, J. P. Corell, Thos. McFarland, Wm. Hughes, John Gilmore, A. C. Jacot, W. E. Barnes, Thos. M. Pierson, A A. Faxon, E. A. Coleman, Jas. Abbott, H. Penner, A. W. Jewett, Robt. Moore, E. G. Macy, John Kelly, C. Deskins, P. Underwood, John Standing, Ed. Pettingell, D. Kostenbader, S. H. Pearson, B. Thomas, Dr. Deskines, Wm. Gardner, Miss Mary Newby, A. Crutchfield, J. W. Scott, J. S. Williams, Chas. Gosner, F. N. Willis, W. H. Gill, A. V. Stout, J. Hague, G. Miller, A. P. Clark, B. Ashby, Mary L. Ashby, N. P. Deming, J. Neal, S. Pearson, Wm. Pardee, Dr. M. A. O'Neill, W. M. Kinley, J. B. O'Neill, P. R. Smith, D. Scouten, C. B. Rice, Mrs. L. E. Fitton, J. L. Pryer, T. S. Wheadon, R. H. Wheadon, Thos. Seaton, Mrs. J. H. Garrett, Haven Jordan, W. Washburne, Eli Frazer, M. P. Hayes.

Deer Creek—A. Wolfkule, H. Diester, Peter Nuffer, A. Messenger, Jacob Beddinger, C. Wolfkule.

VOTED FRUIT LIST FOR KANSAS FOR 1881.

The following circular was sent to a large number of thoroughly practical fruit growers in each county in the State, wherein the experience had become sufficiently extended to afford determinations of a valuable character as to the varieties of the several classes of fruit in their successful adaptation to climate and soil; and from these responses has been compiled the following recommended list:

[CIRCULAR No. 3.]

SECRETARY'S OFFICE, KANSAS STATE HORTICULTURAL SOCIETY,
LAWRENCE, March 10, 1881.

DEAR SIR: I herewith submit for your consideration, "The Voted Fruit List" of this Society for 1879. This list was made up from the recommendations of many of the most experienced and practical fruit growers in this State, as most reliable for general culture. The varieties are arranged in the order of preference, and you are earnestly requested to give it your careful study; and from experience and observation, if deemed advisable, make such changes as the facts will warrant, either by substituting varieties proven to be more worthy, or by changing the order of preference.

VOTED LIST.

APPLES — SUMMER.

Five preferred varieties.	*Change of order.*	*Substitute.*
1. Early Harvest	—	—
2. Carolina Red June	—	—
3. Red Astrachan	—	—
4. Early Pennock	—	—
5. American Summer Pearmain	—	—
AUTUMN.		
1. Maiden's Blush	—	—
2. Rambo	—	—
3. Lowell	—	—
4. Fameuse	—	—
5. Fall Wine	—	—
WINTER.		
Ten preferred varieties.		
1. Winesap	—	—
2. Ben Davis	—	—
3. Jonath'n (late fall, early winter)	—	—
4. Rawles Genet	—	—
5. White Winter Pearmain	—	—
6. Missouri Pippin	—	—
7. Willow Twig	—	—
8. Rome Beauty (late fall, early winter)	—	—
9. Gilpin	—	—
10. Dominie (late fall, early winter)	—	—

PEACHES.

Five preferred varieties.		
1. Crawford's Early	—	—
2. Hale's Early	—	—
3. Crawford's Late	—	—
4. Heath Cling	—	—
5. Large Early York	—	—

PEARS.

Five preferred varieties.	*Change of order.*	*Substitute.*
1. Bartlett	—	—
2. Flemish Beauty	—	—
3. Duchesse d'Angouleme	—	—
4. Seckel	—	—
5. Louise Bonne de Jersey	—	—

PLUMS.

Five preferred varieties.		
1. Wild Goose	—	—
2. Miner	—	—
3. Chickasaw	—	—
4. Damson	—	—
5. Lombard	—	—

CHERRIES.

Five preferred varieties.		
1. Early Richmond	—	—
2. Common Morello	—	—
3. English Morello	—	—
4. May Duke	—	—
5. Governor Wood	—	—

GRAPES.

Four preferred varieties.		
1. Concord	—	—
2. Ives	—	—
3. Dracut Amber	—	—
4. Clinton	—	—

VOTED FRUIT LIST FOR KANSAS, FOR 1880.

	Varieties receiving the largest vote, and preferred in the order named.	SUMMER APPLES.																													
		Lyman Rhoades, Iola	*H. E. Van Deman, Geneva*	*C. C. Kelsey, Humboldt*	*Sam. Buchanan, Welda*	*A. A. Adams, Garnett*	*Thos. F. Cook, Monrovia*	*A. M. Sidwell, Girard*	*G. W. Mosteller, Girard*	*Thos. Ping, Girard*	*Wm. Cutter, Junction City*	*N. Trafton, Milford*	*X. K. Stout, Troy*	*S. Hatch, Wathena*	*O. H. Ayer, Lawrence*	*D. G. Watt, Lawrence*	*Wm. Plasket, Baldwin City*	*C. H. Lovejoy, Vinland*	*Ed. Pettingell, Black Jack*	*Sam. Reynolds, Lawrence*	*John Purtee, Lawrence*	*N. P. Deming, Lawrence*	*Dr. Isaiah Pile, Ottawa*	*Thos. Jones, Princeton*	*E. C. Tracy, Ottawa*	*J. W. Williams, Cope*	*W. D. Barnett, Holton*	*P. Bryant, Holton*	*J. N. Hall, Oskaloosa*	*J. Wheeler, Nortonville*	*Wm. Maxwell, Edgerton*
1	Early Harvest	1	3	1	1	1	1	1	1	1	1	1	2	1	1	3	1	1	1	1	2	1	1	1	1	1	2	1	1	1	1
2	Carolina Red June	2	2	2	2	2	2	2	...	2	...	2	1	2	2	1	2	3	2	2	3	...	2	2	2	2	1	2	2	2	2
3	Red Astrachan	3	4	3	3	3	3	3	...	3	...	3	3	3	3	2	3	2	3	3	1	3	3	3	...	3	3	4	...	3	...
4	Early Pennock	4	...	4	4	4	4	4	4	...	...	4	4	...	4	4	4	4	4	4	4	4	4	4	4	4	4	...	4	...	4
5	American Summer Pear	5	...	...	5	5	...	5	5	5	...	...	5	5	5	5	5	5	5	5	5	5	5	5	5	5	...	5	5	5	5
	Scattering votes :																														
6	Summer Rose	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	Primate	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	Cooper's Early White	...	...	5	...	...	...	...	...	...	4	5	...	...	...	...	...	...	...	...	...	2	...	...	3	...	...	3	...	...	...
9	Duchess of Oldenburgh	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	Hightop Sweet	...	...	...	...	...	...	...	2	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	Keswick Codlin	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...
12	Summer Bellflower	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	Sops-of-Wine	...	...	...	...	...	...	...	...	...	2	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	Woodbridge	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	Early Joe	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...
16	Benoni	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...
17	Fulton Strawberry	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
18	Trenton Early	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	William's Favorite	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	Porter	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	Yellow Ingestrie	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	Yellow June	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	Cole (syn. Scar. Perfume)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	Hawley	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		AUTUMN APPLES.																													
1	**Maiden's Blush**	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	**Rambo**	2	3	2	...	2	2	2	2	2	...	2	2	2	2	3	2	2	2	3	2	2	5	2	2	...	3	...	2	2	2
3	**Lowell**	3	4	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	4	3	3	3	3	3	3	4	3	...	3	3
4	**Fameuse**	4	...	...	4	4	4	4	4	...	5	4	4	4	4	4	4	4	4	4	...	...	4	4	4	4	5	4	4	...	...
5	**Fall Wine**	5	...	...	5	...	5	5	5	5	...	5	5	...	5	5	5	5	5	5	5	5	2	5	5	5	2	...	5	5	5
	Scattering votes :																														
6	**Wine**	...	2	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...
7	**Ortley**	...	5	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	**Autumn Swaar**	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	3	...	...
9	**Grimes's Golden**	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...
10	**Buckingham**	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	**Sweet Pippin**	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	**Gramar's Pearmain**	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	**Fulton**	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	**Cooper's Early White**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...
15	**Benoni**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...
16	**Milam**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...
17	**Imperial**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
18	**Holland Pippin**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	**Porter**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	**Ladies' Fancy**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

VOTED FRUIT LIST—CONTINUED.

	E. P. Diehl, Olathe	H. Perley, Spring Hill	G. M. Waugh, Gardner	B. S. McFarland, Olathe	J. B. Draper, Oswego	J. L. Williams, Oswego	H. S. Coley, Oswego	C. G. Wickersham, Parsons	F. Wellhouse, Leavenworth	E. J. Holman, Leavenworth	J. S. Van Winkle, Pleasant Ridge	A. G. Seaman, Cadmus	J. W. Latimer, Pleasanton	Ed. Billings, Prescott	A. G. Wilhite, Emporia	C. D. Burdick, Emporia	J. M. Miller, Emporia	Robert Milliken, Emporia	John L. Mason, New Lancaster	C. W. Hayden, Thayer	G. W. Ashby, Chanute	D. B. Skeels, Erie	Sol. Bower, Olivet	J. G. Clark, Waveland	Jos. Johnson, Burlingame	Peter Kirby, Burlingame	T. C. Wells, Manhattan	J. W. Blain, Manhattan	T. K. Hair, Riley Center	J. G. Sampson, El Paso	Wm. McCracken, Sunny Dale	Thos. Buckman, Topeka	Abner Allen, Wabaunsee	N. H. Pixley, Wamego	H. A. Stiles, Pavilion	G. B. Brown, Guilford	R. D. Webster, Yates Center	W. W. Smith, Neosho Falls	C. H. Carpenter, Wyandotte	W. W. Dickinson, Wyandotte	Totals
SUMMER APPLES.																																									
1	1	1	3	1	1	2	1	2	1	...	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	...	1	58
2	2	2	2	2	2	3	2	3	2	2	...	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	...	2	2	3	2	2	2	2	2	2	2	56
3	3	...	1	3	3	1	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	...	3	3	3	3	3	3	3	55
4	...	3	4	4	4	4	4	5	4	4	...	4	...	...	...	4	4	4	...	...	...	...	4	4	4	4	4	4	4	4	4	4	4	4	4	4	...	4	...	...	50
5	5	5	5	5	5	5	5	...	...	...	4	5	...	5	5	...	5	5	5	5	5	5	5	5	5	5	5	5	...	5	5	5	5	5	5	5	5	5	5	5	57
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...
8	4	...	...	...	...	...	...	...	5	1	2	...	...	...	...	...	...	...	...	...	4	4	...	...	...	...	...	...	...	2	...	...	...	...	...	...	4	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...
AUTUMN APPLES.																																									
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	3	1	1	1	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	69
2	2	2	2	2	2	2	2	2	2	5	...	2	4	2	2	1	2	2	2	4	2	2	3	2	2	1	2	2	...	3	2	2	2	2	2	2	3	2	2	3	49
3	...	4	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	...	2	3	1	2	3	3	2	3	3	3	2	3	3	3	3	3	3	2	3	3	4	54
4	4	3	4	4	4	4	4	4	4	4	4	4	5	4	4	4	4	4	4	5	4	4	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	...	55
5	5	...	5	5	5	5	5	5	5	...	5	5	...	5	5	5	5	5	5	3	5	5	5	5	5	4	5	5	...	5	5	5	5	5	...	5	5	5	...	5	55
6	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	3	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	2	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

VOTED FRUIT LIST — CONTINUED.

		WINTER APPLES.																													
	Varieties receiving the largest vote, and preferred in the order named.	*Lyman Rhoades, Iola*	*H. E. Van Deman, Geneva*	*C. C. Kelsey, Humboldt*	*Sam. Buchanan, Welda*	*A. A. Adams, Garnett*	*Thos. F. Cook, Monrovia*	*A. M. Stilwell, Girard*	*G. W. Mosteller, Girard*	*Thos. Ping, Girard*	*Wm. Cutter, Junction City*	*N. Trafton, Milford*	*X. K. Stout, Troy*	*S. Hatch, Wathena*	*O. H. Ayer, Lawrence*	*D. G. Watt, Lawrence*	*Wm. Plasket, Baldwin City*	*C. H. Lovejoy, Vinland*	*E. D. Pettingell, Black Jack*	*Sam. Reynolds, Lawrence*	*John Pardee, Lawrence*	*N. P. Deming, Lawrence*	*Dr. Isaiah Pile, Ottawa*	*Thos. Jones, Princeton*	*E. C. Tracy, Ottawa*	*J. W. Williams, Cope*	*W. D. Barnett, Holton*	*P. Bryant, Holton*	*J. N. Hall, Oskaloosa*	*Joshua Wheeler, Nortonville*	*Wm. Maxwell, Edgerton*
1	Winesap	1	1	1	1	1	2	1	2	1	4	1	3	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	3	1	1
2	Ben Davis	2	2	4	6	2	1	2	4	2	1	4	1	2	4	2	2	2	2	2	1	2	6	2	8	2	3	2	4	2	4
3	Jonathan	3	5	6	3	6	6	3	5	...	6	3	4	3	2	3	6	3	3	3	4	3	3	3	3	3	4	8	2	3	3
4	Rawles Genet	4	4	2	4	4	4	4	3	4	2	2	2	4	3	4	4	7	4	4	5	4	4	4	4	4	2	9	5	4	2
5	White Winter Pearmain	5	7	7	10	5	5	5	...	5	...	5	5	6	5	5	5	4	5	5	6	5	...	5	5	5	5	5	1	...	5
6	Missouri Pippin	6	3	3	2	3	3	6	1	6	3	6	6	5	...	...	3	5	6	6	2	8	2	6	6	6	...	6	6	6	6
7	Willow Twig	7	8	5	7	7	7	7	7	7	7	10	7	7	6	7	7	6	7	10	7	7	7	7	7	7	6	7	...	7	...
8	Rome Beauty	8	6	8	8	8	8	8	6	8	...	8	8	8	8	6	8	8	8	8	8	6	8	8	2	8	7	8	8	8	8
9	Gilpin	9	...	...	9	9	...	9	9	...	...	9	9	9	9	9	9	9	...	9	9	9	9	...	9	9	...	10	9	...	9
10	Dominie	10	...	...	...	...	10	10	...	...	...	7	10	10	10	10	...	...	10	7	10	10	10	...	10	10	8	4	10	10	10
	Scattering votes:																														
11	Stark	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	Grimes's Golden	...	10	...	5	...	...	...	8	...	5	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	Limber Twig	...	...	9	...	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	Smith's Cider	...	...	10	...	...	...	...	10	...	9	...	...	...	...	8	...	10	...	...	...	...	5	...	...	...	9	...	...	...	...
15	May	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
16	Stogsdill's Red	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	Baldwin	...	...	...	...	...	...	...	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	Red Winter Pearmain	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	Fink	...	...	...	...	...	...	...	...	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	McAfee's Nonsuch	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	...	9	...	...	...	...	...	...	...
21	White Pippin	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	Michael Henry Pippin	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	...	...	...	...	...	...	...	...	...	...	...	...
23	Pennock	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...
24	Talman's Sweet	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...
25	Milam	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...	...
26	Ortley	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...
27	Seek-no-further	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	...
28	York Imperial	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	Wagener	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	Smokehouse	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	Roman Stem	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	Yellow Bellflower	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	Bentley Sweet	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	Lawver	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
35	Mason's Orange	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	Buckingham	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	Mountain Rose	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	Rhode Island Greening	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	Lansingburgh	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
40	Gen. Lyon	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41	Hubbardston's Nonsuch	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

VOTED FRUIT LIST—CONTINUED.

	WINTER APPLES.																																							
	E. P. Deihl, Olathe	H. Perley, Spring Hill	G. M. Waugh, Gardner	B. S. McFarland, Olathe	J. R. Draper, Oswego	J. L. Williams, Oswego	H. S. Coley, Oswego	C. G. Wickersham, Parsons	F. Wellhouse, Leavenworth	E. J. Holman, Leavenworth	J. S. Van Winkle, Leavenworth	A. G. Seaman, Cadmus	J. W. Latimer, Pleasanton	Ed. Billings, Prescott	A. G. Wilkie, Emporia	C. D. Burdick, Emporia	J. M. Miller, Emporia	R. Milliken, Emporia	J. L. Mason, New Lancaster	C. W. Hayden, Thayer	G. W. Ashby, Chanute	D. B. Skeels, Erie	Sol. Bower, Olivet	J. G. Clark, Waveland	Joseph Johnson, Burlingame	Peter Kirby, Burlingame	T. C. Wells, Manhattan	J. W. Blain, Manhattan	T. K. Hair, Riley Center	J. G. Sampson, El Paso	Wm. McCracken, Sunny Dale	Thos. Buckman, Topeka	Abner Allen, Wabaunsee	N. H. Pixley, Wamego	H. A. Stiles, Pavilion	G. B. Brown, Guilford	R. D. Webster, Yates Center	W. W. Smith, Neosho Falls	C. H. Carpenter, Wyandotte	W. W. Dickinson, Wyandotte	Totals
1	...	1	...	1	1	1	1	1	1	2	1	1	4	1	1	2	1	3	1	1	1	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	56
2	2	2	3	3	5	2	2	2	2	1	2	6	1	2	2	6	2	1	2	2	2	3	4	2	2	3	2	2	2	2	2	2	2	2	2	3	3	2	2	2	43
3	3	3	7	4	3	3	3	3	3	3	3	4	3	7	3	...	3	5	8	3	3	...	3	...	3	4	3	3	3	3	3	3	3	3	3	2	4	5	3	3	44
4	4	4	4	5	6	4	4	4	4	4	4	3	7	6	4	1	4	2	4	4	4	8	2	4	4	5	4	4	...	4	4	4	...	4	4	5	5	4	4	4	44
5	...	10	5	6	7	9	5	5	...	5	5	7	...	4	5	5	5	6	5	...	5	...	5	5	5	1	5	5	5	5	5	5	5	5	5	4	7	6	...	5	42
6	5	5	6	2	4	5	6	6	6	6	6	5	6	5	6	7	6	4	6	5	6	1	6	6	6	6	6	6	6	6	6	6	6	6	6	6	2	3	6	...	39
7	7	7	...	8	2	6	7	7	7	7	7	2	2	3	7	...	7	7	7	7	7	5	7	...	7	7	7	7	7	7	7	7	7	7	7	...	6	7	7	7	49
8	8	8	8	7	8	7	8	8	8	8	8	8	...	8	8	...	8	8	...	8	8	7	8	8	8	8	8	8	8	8	8	8	...	8	8	8	8	...	8	8	55
9	...	...	9	10	9	8	9	9	9	9	...	9	...	9	9	9	9	...	9	6	9	9	...	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	...	50
10	10	...	10	...	10	10	10	10	10	10	...	...	...	10	10	8	10	10	...	9	...	...	10	10	10	10	10	10	10	10	10	10	...	...	10	10	10	10	...	...	42
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	10	10	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	4	10	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...	...	...	...	...
14	...	6	1	...	...	...	...	...	5	...	...	...	8	...	...	...	...	...	...	...	...	10	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	9	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	4	...	...	...	8	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	...	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28	1	...	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
32	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
33	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	9	...
35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...
40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...
41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...

VOTED FRUIT LIST—CONTINUED.

	Varieties receiving the largest vote, and preferred in the order named.	*Lyman Rhoades, Iola*	*H. E. Van Deman, Geneva*	*C. C. Kelsey, Humboldt*	*Sam. Buchanan, Welda*	*A. A. Adams, Garnett*	*Thos. F. Cook, Monrovia*	*A. M. Sidwell, Girard*	*G. W. Mosteller, Girard*	*Thos. Ping, Girard*	*Wm. Cutter, Junction City*	*N. Trafton, Milford*	*N. K. Stout, Troy*	*S. Hatch, Wathena*	*O. H. Ayer, Lawrence*	*D. G. Watt, Lawrence*	*Wm. Plasket, Baldwin City*	*C. H Lovejoy, Vinland*	*E. D. Pettingell, Black Jack*	*Sam. Reynolds, Lawrence*	*John Purdee, Lawrence*	*N. P. Deming, Lawrence*	*Dr. Isaiah Pile, Ottawa*	*Thos. Jones, Princeton*	*E. C. Tracy, Ottawa*	*J. W. Williams, Cope*	*W. D. Barnett, Holton*	*P. Bryant, Holton*	*J. N. Hall, Oskaloosa*	*Joshua Wheeler, Nortonville*	*Wm. Maxwell, Edgerton*
		PEACHES.																													
1	Crawford's Early	1	...	...	1	1	1	1	...	1	...	1	...	1	1	2	1	1	1	...	5	1	1	1	1	1	1	1	1	...	1
2	Hale's Early	2	3	2	2	2	2	...	...	2	4	5	2	...	3	...	...	2	2	2	...	2	...	2	2	2	2	2	2	...	2
3	Crawford's Late	3	...	...	3	3	3	3	3	3	...	3	3	3	2	3	3	3	3	3	...	3	3	3	3	3	3	3	3	3	3
4	Heath Cling	4	4	3	4	4	4	4	...	4	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	...	4
5	Large Early York	5	...	5	5	...	5	5	...	5	5	2	5	5	5	5	5	5	5	5	...	5	5	5	5	5	5	5	5	5	5
	Scattering votes:																														
6	Early Louise	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	Alexander	...	2	...	...	...	...	...	2	...	...	...	...	...	...	1	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...
8	Indian Blood Cling	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	Amsden's June	...	...	1	...	...	...	2	...	...	1	...	1	2	...	...	2	...	...	1	...	...	...	...	...	...	...	...	...	2	...
10	Old Mixon	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	President	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	Stump the World	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
13	Steadly	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	Admirable	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	Ward's Late Free	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	Heath Free	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...
17	Pomona Freestone	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...
18	Cooledge's Favorite	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
19	Barnard	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...
20	Early Beatrice	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	Troth's Early Red	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	Smock	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	Brice	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	Italian	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	Wyandotte Chief	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		PEARS.																													
1	**Bartlett**	1	1	1	2	1	1	1	1	1	2	1	1	1	1	1	1	1	No experience.	1	1	1	1	1	1	1	1	1	1	1	1
2	**Flemish Beauty**	2	2	2	1	2	2	2	3	2	1	2	2	2	4	2	2	2		2	4	2	2	2	2	2	2	2	2	2	2
3	**Duchesse d'Angouleme**	3	3	3	3	3	3	3	2	3	3	3	3	3	2	3	3	3		3	3	3	3	3	3	3	3	3	3	3	3
4	**Seckel**	4	4	...	4	4	4	4	5	4	4	4	4	4	3	4	4	4		4	...	4	4	4	4	4	4	4	4	4	4
5	**Louise Bonne de Jersey**	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	...		5	5	5	5	5	5	5	5	5	5	5	5
	Scattering votes:																														
6	**Vicar of Winkfield**	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...
7	**Howell**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5		...	...	...	...	...	...	...	...	...	...	...	...
8	**Beurre d'Anjou**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	2	...	...	...	...	...	...	...	...	...	...
9	**St. Lawrence**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...
10	**Clapp's Favorite**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...
11	**Sheldon**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...
12	**Bloodgood**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...
		PLUMS.																													
1	Wild Goose	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Miner	2	2	2	2	2	2	2	2	...	2	2	2	2	...	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	Chickasaw	3	3	3	3	3	3	3	...	3	...	3	3	3	...	3	3	3	3	3	3	3	...	3	3	3	3	3	3	3	3
4	Damson	4	...	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4	4	4
5	Lombard	5	...	5	5	5	5	5	...	...	5	5	5	5	5	5	5	5	5	5	5	5	...	5	5	5	5	5	5	5	5
	Scattering votes:																														
6	Yellow Egg	...	...	...	...	...	...	...	3	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	German Prune	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	Green Gage	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	Girard	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	Kansas varieties	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	Peach	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	Washington	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	Shropshire Damson	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	Gen. Hand	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	Yellow Magnum Bonum	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	Smith's Orleans	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	Sand	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

VOTED FRUIT LIST—CONTINUED.

PEACHES.

	E. P. Diehl, Olathe	H. Perley, Spring Hill	G. M. Waugh, Gardner	B. S. McFarland, Olathe	J. B. Draper, Oswego	J. L. Williams, Oswego	H. S. Coley, Oswego	C. G. Wickersham, Parsons	F. Wellhouse, Leavenworth	E. J. Holman, Leavenworth	J. S. Van Winkle, Pleasant Ridge	A. G. Seaman, Cadmus	J. W. Latimer, Pleasanton	Ed. Billings, Prescott	A. G. Wilhite, Emporia	C. D. Burdick, Emporia	J. M. Miller, Emporia	R. Milliken, Emporia	John L. Mason, New Lancaster	C. W. Hayden, Thayer	G. W. Ashby, Chanute	D. B. Skeels, Erie	Sol. Bower, Olivet	J. G. Clark, Waveland	Joseph Johnson, Burlingame	Peter Kirby, Burlingame	T. C. Wells, Manhattan	J. W. Blain, Manhattan	T. K. Hair, Riley Center	J. G. Simpson, El Paso	Wm. McCracken, Sunny Dale	Thos. Buckman, Topeka	Abner Allen, Wabaunsee	N. H. Pixley, Wamego	H. A. Stiles, Pavillion	G. B. Brown, Guilford	R. D. Webster, Yates Center	W. W. Smith, Neosho Falls	C. H. Carpenter, Wyandotte	W. W. Dickinson, Wyandotte	Totals
1	...	1	1	1	5	1	1	...	3	...	...	5	1	...	1	1	1	1	1	...	...	1	2	1	1	1	1	1	1	3	...	1	1	2	1	...	1	1	1	2	45
2	...	2	2	2	...	2	2	2	4	3	...	...	...	2	2	2	2	2	2	2	2	2	1	...	2	2	2	2	2	4	2	2	2	1	2	2	2	2	...	...	45
3	3	3	3	3	3	3	3	5	5	...	...	...	...	...	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	5	3	3	3	3	3	3	3	3	3	4	56
4	4	4	4	4	...	5	...	...	...	...	4	4	4	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	...	4	4	4	4	4	4	4	4	4	5	57
5	5	5	5	5	1	4	5	3	...	...	5	1	...	3	5	5	5	5	5	5	5	5	...	5	5	5	5	5	5	...	5	5	5	5	5	5	5	...	5	3	43
6	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	1	2	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	1	...	...	...	...	...	...	...	...	...	2	...	2	1	...	...	...	...	...	...	1	...	...	2	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	4	4	1	...	3	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	1	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	4	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	4	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...
23	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...

PEARS.

	E. P. Diehl, Olathe	H. Perley, Spring Hill	G. M. Waugh, Gardner	B. S. McFarland, Olathe	J. B. Draper, Oswego	J. L. Williams, Oswego	H. S. Coley, Oswego	C. G. Wickersham, Parsons	F. Wellhouse, Leavenworth	E. J. Holman, Leavenworth	J. S. Van Winkle, Pleasant Ridge	A. G. Seaman, Cadmus	J. W. Latimer, Pleasanton	Ed. Billings, Prescott	A. G. Wilhite, Emporia	C. D. Burdick, Emporia	J. M. Miller, Emporia	R. Milliken, Emporia	John L. Mason, New Lancaster	C. W. Hayden, Thayer	G. W. Ashby, Chanute	D. B. Skeels, Erie	Sol. Bower, Olivet	J. G. Clark, Waveland	Joseph Johnson, Burlingame	Peter Kirby, Burlingame	T. C. Wells, Manhattan	J. W. Blain, Manhattan	T. K. Hair, Riley Center	J. G. Simpson, El Paso	Wm. McCracken, Sunny Dale	Thos. Buckman, Topeka	Abner Allen, Wabaunsee	N. H. Pixley, Wamego	H. A. Stiles, Pavillion	G. B. Brown, Guilford	R. D. Webster, Yates Center	W. W. Smith, Neosho Falls	C. H. Carpenter, Wyandotte	W. W. Dickinson, Wyandotte	Totals
1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	No experience.	1	1	1	2	1	1	1	1	3	1	1	1	1	1	1	1	1	1	No bearing trees.	1	1	1	62
2	2	2	2	2	2	2	2	2	2	4	2	2	5	2	2	2	2		2	2	2	5	2	2	2	2	2	2	2	2	2	2	...	2	2	2		2	2	2	58
3	4	3	3	3	3	3	3	3	3	1	3	3	3	3	3	3	3		3	3	3	1	3	3	3	3	5	3	3	3	3	3	3	3	3	3		3	3	3	61
4	5	4	4	4	4	5	4	4	4	3	4	4	4	4	4	4	4		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		4	4	4	60
5	3	5	5	5	5	4	5	...	5	5	5	5	...	...	5	5	5		5	5	...	3	5	5	5	5	1	5	5	5	5	5	...	5	5	5		5	5	...	55
6	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...		...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...		...	...	...	...
9	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...		...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	5	...

PLUMS.

	E. P. Diehl, Olathe	H. Perley, Spring Hill	G. M. Waugh, Gardner	B. S. McFarland, Olathe	J. B. Draper, Oswego	J. L. Williams, Oswego	H. S. Coley, Oswego	C. G. Wickersham, Parsons	F. Wellhouse, Leavenworth	E. J. Holman, Leavenworth	J. S. Van Winkle, Pleasant Ridge	A. G. Seaman, Cadmus	J. W. Latimer, Pleasanton	Ed. Billings, Prescott	A. G. Wilhite, Emporia	C. D. Burdick, Emporia	J. M. Miller, Emporia	R. Milliken, Emporia	John L. Mason, New Lancaster	C. W. Hayden, Thayer	G. W. Ashby, Chanute	D. B. Skeels, Erie	Sol. Bower, Olivet	J. G. Clark, Waveland	Joseph Johnson, Burlingame	Peter Kirby, Burlingame	T. C. Wells, Manhattan	J. W. Blain, Manhattan	T. K. Hair, Riley Center	J. G. Simpson, El Paso	Wm. McCracken, Sunny Dale	Thos. Buckman, Topeka	Abner Allen, Wabaunsee	N. H. Pixley, Wamego	H. A. Stiles, Pavillion	G. B. Brown, Guilford	R. D. Webster, Yates Center	W. W. Smith, Neosho Falls	C. H. Carpenter, Wyandotte	W. W. Dickinson, Wyandotte	Totals
1	1	1	1	1	1	1	1	5	1	1	1	1	1	1	1	1	1	1	1	...	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	A failure.	1	1	1	66
2	2	2	2	2	...	2	2	...	2	5	2	2	2	2	2	2	2	2	2	...	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		2	2	2	63
3	5	3	3	3	3	3	3	...	3	...	3	3	3	...	3	3	3	3	3	...	3	3	3	...	3	3	3	3	3	3	3	2	3	3	3	3		3	3	3	58
4	4	4	4	4	4	4	4	...	4	4	4	4	4	...	4	4	4	4	4	...	4	4	4	4	4	4	4	4	4	4	...	4	4	4	4	4		4	4	4	63
5	3	5	5	5	5	5	5	2	5	3	5	5	...	...	5	5	5	5	5	...	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		5	5	5	59
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
8	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
12	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
13	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
14	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
15	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...		...	...	...	...

VOTED FRUIT LIST—CONTINUED.

		CHERRIES.																													
	Varieties receiving the largest vote, and preferred in the order named.	*Lyman Rhoades, Iola*	*H. E. Van Deman, Geneva*	*C. C. Kelsey, Humboldt*	*Sam. Buchanan, Welda*	*A. A. Adams, Garnett*	*Thos. F. Cook, Monrovia*	*A. M. Sidwell, Girard*	*G. W. Mosteller, Girard*	*Thos. Ping, Girard*	*Wm. Cutter, Junction City*	*N. Trafton, Milford*	*X. K. Stout, Troy*	*S. Hatch, Wathena*	*O. H. Ayer, Lawrence*	*D. G. Watt, Lawrence*	*Wm. Plasket, Baldwin City*	*C. H. Lovejoy, Vinland*	*E. D. Pettingell, Black Jack*	*Sam. Reynolds, Lawrence*	*John Purdue, Lawrence*	*N. P. Deming, Lawrence*	*Dr. Isaiah Pile, Ottawa*	*Thos. Jones, Princeton*	*E. C. Tracy, Ottawa*	*J. W. Williams, Cope*	*W. D. Barnett, Holton*	*F. Bryant, Holton*	*J. M. Hall, Oskaloosa*	*Joshua Wheeler, Nortonville*	*Wm. Maxwell, Edgerton*
1	Early Richmond	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Common Morello	2	2	3	2	...	2	2	2	2	3	2	2	3	3	3	2	2	2	3	2	2	2	2	2	2	2	...	2	2	2
3	English Morello	3	3	2	3	2	3	3	3	3	2	4	3	2	4	2	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3
4	May Duke	4	5	5	4	3	4	4	4	4	4	3	4	4	5	...	4	4	4	4	4	4	...	4	4	4	4	4	4	4	...
5	Governor Wood	5	...	4	5	...	5	5	...	...	5	5	5	5	...	...	...	5	5	5	5	5	...	5	5	5	5	5	5	...	5
	Scattering votes:																														
6	Reine Hortense	...	4	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	Belle Magnifique	...	...	...	...	...	...	...	5	...	...	...	...	...	2	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	Norwood	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	Late Richmond	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...
10	Downer's Late	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...
11	King's Early	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
12	Montmorency Ordinaire	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	Royal Duke	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	Plumstone Morello	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	Elton	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		GRAPES.																													
1	**Concord**	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	**Ives**	2	2	2	4	...	2	2	3	2	2	2	2	2	4	2	2	2	...	2	2	2	2	2	2	2	2	2	2	...	2
3	**Dracut Amber**	3	3	3	2	2	3	3	1	3	4	3	3	3	...	3	3	3	2	3	3	3	...	3	3	3	3	3	3	3	3
4	**Clinton**	4	4	4	3	...	4	4	4	4	...	...	4	4	3	4	4	4	3	...	4	...	...	4	4	4	4	4	4	4	4
	Scattering votes:																														
5	**Creveling**	..	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	**Catawba**	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	**Goethe**	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	**Lindley**	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	**Delaware**	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	4	...	4	...	...	...	...	...	...	...	2	...
10	**Lady**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	**Martha**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	**Hartford**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	**Taylor**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	**Elvira**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	**Cynthiana**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	**Norton's**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	**Salem**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

VOTED FRUIT LIST—CONTINUED.

	E. P. Deihl, Olathe	*H. Perley, Spring Hill*	*G. M. Waugh, Gardner*	*B. S. McFarland, Olathe*	*J. B. Draper, Oswego*	*J. L. Williams, Oswego*	*H. S. Coley, Oswego*	*C. G. Wickersham, Parsons*	*F. Wellhouse, Leavenworth*	*E. J. Holman, Leavenworth*	*J. S. Van Winkle, Pleasant Ridge*	*A. G. Seaman, Cadmus*	*J. W. Latimer, Pleasanton*	*Ed. Billings, Prescott*	*A. G. Wilkie, Emporia*	*C. D. Burdick, Emporia*	*J. M. Muller, Emporia*	*R. Milliken, Emporia*	*John L. Mason, New Lancaster*	*C. W. Hayden, Thayer*	*G. W. Ashby, Chanute*	*D. B. Skeels, Erie*	*Sol. Bower, Olivet*	*J. G. Clark, Waveland*	*Joseph Johnson, Burlingame*	*Peter Kirby, Burlingame*	*T. C. Wells, Manhattan*	*Jas. W. Blain, Manhattan*	*T. K. Hair, Riley Center*	*J. G. Sampson, El Paso*	*Wm. McCracken, Sunny Dale*	*Thos. Buckman, Topeka*	*Abner Allen, Wabaunsee*	*N. H. Pixley, Wamego*	*H. A. Stiles, Pavilion*	*G. B. Brown, Guilford*	*R. D. Webster, Yates Center*	*W. W. Smith, Neosho Falls*	*C. H. Carpenter, Wyandotte*	*W. W. Dickinson, Wyandotte*	*Totals*
CHERRIES.																																									
1	1	1	1	1	3	1	1	4	1	2	1	1	1	1	1	1	1	1	1	1	1	...	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	65
2	2	2	2	2	2	2	2	...	2	5	2	3	2	...	2	2	2	3	2	3	3	1	1	2	2	2	2	2	2	...	...	2	2	2	2	...	2	2	...	...	48
3	3	3	3	3	1	3	3	5	3	1	3	2	3	...	3	3	3	2	3	2	2	2	...	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	51
4	4	4	4	4	4	...	4	3	4	3	4	4	4	...	4	4	4	4	4	...	4	...	...	4	4	4	4	4	4	4	4	4	...	4	4	4	4	4	...	3	52
5	5	5	5	5	5	5	...	...	5	...	5	5	...	...	5	5	5	5	5	...	5	...	...	5	5	5	5	5	5	5	5	5	...	5	5	5	5	5	5	...	50
6	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	4	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	2	...	...	4	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	4	...
GRAPES.																																									
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	69
2	2	2	3	2	...	3	2	2	2	2	2	2	2	2	2	2	2	2	2	...	3	2	2	2	2	2	2	2	2	2	2	2	...	2	2	2	2	3	...	...	55
3	...	3	2	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	...	2	3	3	...	3	3	3	3	3	3	3	3	...	3	3	...	3	2	3	...	52
4	...	4	4	4	...	4	4	4	4	...	4	4	4	4	4	4	4	4	4	...	4	4	4	...	4	4	4	4	4	4	4	4	3	4	4	4	4	4	...	...	53
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	4	...	...	3	...	...	...	...	...
10	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	4	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...
12	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	4	...
13	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...

VOTED FRUIT LIST — CONTINUED.

	Varieties receiving the largest vote, and preferred in the order named.	*W. W. Dickinson, Wyandotte.*	*C. E. Wilcox, Wyandotte*	*W. W. Smith, Neosho Falls*	*R. D. Webster, Yates Center*	*H. A. Stiles, Pavilion*	*Abner Allen, Wabaunsee*	*Thos. Buckman, Topeka*	*Thos. C. Wells, Manhattan*	*N. H. Pixley, Wamego*	*W. D. Jones, Barclay*	*J. Q. Coes, Grand Haven*	*J. G. Clark, Waveland*	*G. W. Ashby, Chanute*	*F. B. Harris, White City*	*J. L. Mason, New Lancaster*	*L. Bishop, Osawatomie*
	STRAWBERRIES.																
1	Wilson's Albany	2	......	1	1	1	1	1	2	1	2	1	1	3	1	1	......
2	Chas. Downing	1	1	......	2	2	2	2	3	2	1	......	2	2	3	2	2
3	Green Prolific	3	3	3	3	3	3	3	4	3	3	......	3	......	......	3	3
4	Kentucky (late)	4	......	2	4	4	4	4	5	4	......	......	4	......	2	4	4
5	Col. Cheney	......	......	4	5	5	5	5	......	5	......	......	5	......	......	5	5
	Scattering votes:																
6	Capt. Jack	5	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
7	Downer's Prolific	......	2	......	......	......	......	......	......	......	......	......	......	......	......	......	......
8	Cumberland Triumph	......	4	......	......	......	......	......	......	......	......	......	......	4	......	......	......
9	Crescent Seedling	......	5	......	......	......	......	......	......	......	......	......	......	......	......	......	......
10	Hovey's Seedling	......	......	......	......	......	......	......	1	......	......	......	......	......	......	......	......
11	Dr. Warder	......	......	......	......	......	......	......	......	......	......	......	......	1	......	......	......
12	Champion	......	......	......	......	......	......	......	......	......	......	......	......	5	......	......	......
13	Longworth's Prolific	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1
14	Monarch of the West	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
15	Sharpless	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
16	Austin	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
17	Seth Boyden	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
	BLACKBERRIES.																
1	Kittatinny	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Lawton	2	2	2	2	2	2	2	......	2	......	......	2	2	2	......	2
	Scattering votes:																
3	Snyder	......	3	......	......	......	......	......	2	......	2	......	3	......	......	......	......
4	Dorcester	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
	RASPBERRIES.																
1	Doolittle (early)	2	1	......	1	......	......	1	1	1	1	......	1	1	1	1	1
2	Miami (med.)	3	2	1	2	2	2	2	......	2	2	1	2	2	......	2	2
3	McCormick (late)	1	3	2	3	1	3	3	2	3	3	......	3	3	......	3	3
4	Philadelphia (red)	......	4	3	4	3	......	4	......	4	......	......	4	......	......	4	4
	Scattering votes:																
5	Turner	4	......	......	......	......	......	......	4	......	4	......	......	4	......	......	......
6	Thwack	......	5	......	......	......	......	......	......	......	......	......	......	......	......	......	......
7	Turner	......	6	......	......	......	......	......	......	......	......	......	......	......	......	......	......
8	Ganargua	......	......	......	......	......	1	......	......	......	......	......	......	......	......	......	......
9	Miller's Daily	......	......	......	......	......	4	......	......	......	......	......	......	......	......	......	......
10	Native variety	......	......	......	......	......	......	......	......	......	......	......	......	......	2	......	......
11	Gregg	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
12	Brandywine	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
13	Clark	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
14	Cuthbert	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
15	Smith's	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
	GOOSEBERRIES.																
1	Houghton	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Pale Red	2	2	2	2	2	2	2	2	2	2	......	2	3	......	......	2
3	Downing	3	3	3	3	3	3	3	3	3	3	......	3	2	......	......	3
4	Mountain	4	4	4	4	4	4	4	4	4	4	......	4	......	......	......	4
	CURRANTS.																
1	Large Red Dutch	1	1	1	1	1	1	1	1	1	No success.	1	1	1	No experience.	No success.	1
2	White Grape	2	2	2	2	2	2	2	2	2		2	2	2			2
3	White Dutch	3	3	3	3	3	3	3	3	3		3	3	3			3
4	Black Naples	4	4	4	4	4	4	4	4	4		4	4	4			4
	Scattering votes:																
5	Cherry	......	......	......	......	......	......	......	......	......		......	......	......			......
6	La Versailles	......	......	......	......	......	......	......	......	......		......	......	......			......
7	London Red	......	......	......	......	......	......	......	......	......		......	......	......			......
8	Victoria	......	......	......	......	......	......	......	......	......		......	......	......			......

VOTED FRUIT LIST—CONCLUDED.

	Robt. Milliken, Emporia	J. V. Randolph, Emporia	A. G. Wilhite, Emporia	Ed. Billings, Prescott	J. W. Latimer, Pleasanton	A. G. Seaman, Cadmus	J. S. Van Winkle, Pleas. Ridge	E. J. Holman, Leavenworth	J. C. Gist, Leavenworth	J. L. Williams, Oswego	H. S. Coley, Oswego	C. G. Wickersham, Parsons	E. P. Diehl, Olathe	H. Perley, Spring Hill	Wm. Maxwell, Edgerton	W. D. Barnett, Holton	Jacob Dixon, Holton	J. W. Williams, Cope	H. P. Welch, Ottawa	G. C. Brackett, Lawrence	C. H. Lovejoy, Vinland	D. G. Watt, Lawrence	Omar H. Ayer, Lawrence	John Purdee, Lawrence	Wm. Cutler, Junction City	G. W. Mosteller, Girard	C. H. Graham, Leroy	Thos. W. Smith, Bax. Spr'gs	H. E. Van Deman, Geneva	A. L. Dornburg, Humboldt	C. C. Kelsey, Humboldt	D. W. Houston, Garnett	W. G. Evans, Pleasanton	Thos. F. Cook, Monrovia	S. Hatch, Wathena	A. C. Jacob, Media	Total
STRAWBERRIES.																																					
1	1	1	1	1	1	1	No report.	...	1	2	1	1	1	1	1	1	1	1	...	1	No report.	1	1	2	2	1	1	1	1	1	1	1	1	1	...	...	37
2	2	2	2	2	...	2		1	2	1	2	2	2	2	2	2	2	2	2	...		2	2	1	1	2	2	2	3	2	2	2	...	2	...	...	38
3	...	3	...	3	3	3		...	3	4	3	3	3	3	...	3	3	3	3	4		3	3	...	...	3	3	3	...	3	3	3	3	3	...	...	35
4	3	4	4	4	2	4		...	4	3	4	4	...	4	4	4	4	4	4	3		4	4	...	...	4	4	4	5	4	4	4	4	4	...	...	32
5	5	5	5	5	...	5		...	5	...	5	5	...	5	5	5	5	5	...	...		5	5	...	...	5	5	5	4	5	5	5	...	5	...	...	30
6	4	...	3	...	...	...		3	...	...	...	...	...	...	...	...	...	...	...	5		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...		2	...	...	...	...	...	...	3	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...		5	...	...	...	...	...	...	...	...	...	...	1	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...		4	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	5	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	2		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...
BLACKBERRIES.																																					
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	...	...	50
2	...	2	2	2	...	2	2	...	2	2	2	2	2	...	2	2	2	2	...	2	2	2	2	...	2	...	2	2	2	2	2	2	...	2	...	...	38
3	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	2	..	2	...	...	3	...	...	...	...	...	...	...	...
4	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
RASPBERRIES.																																					
1	...	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	...	1	2	1	1	1	...	1	1	1	2	2	1	1	1	1	...	...	38
2	1	2	2	2	2	2	2	3	2	2	2	...	2	2	3	2	2	2	2	...	3	...	2	...	1	2	2	2	1	1	2	2	2	2	...	...	34
3	3	3	3	3	3	3	3	2	3	3	3	2	...	3	1	3	3	3	3	3	1	3	3	3	2	3	3	3	4	3	3	3	3	3	...	...	37
4	...	4	4	4	...	4	4	...	4	...	...	4	...	4	4	4	4	4	...	...	...	4	...	...	...	...	4	4	...	4	4	4	...	4	...	...	26
5	4	...	...	...	4	...	...	...	...	4	4	...	...	...	...	...	...	...	4	4	...	...	...	4	3	4	...	...	3	...	...	...	4	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	4	2	...	...	...	...	...	...	...	...	...	...	...	...	...
GOOSEBERRIES.																																					
1	...	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	No rep't.	1	...	...	46
2	3	2	2	2	...	2	2	2	2	2	2	...	...	...	2	2	2	2	2	1	2	2	2	...	2	2	2	2	2	2	2	2		2	...	...	38
3	1	3	3	3	...	3	3	3	3	3	3	1	...	...	3	3	3	3	3	...	3	...	3	...	3	3	3	3	3	3	3	3		3	...	...	37
4	2	4	4	4	...	4	4	4	4	4	4	...	...	...	4	4	4	4	4	...	4	...	4	...	...	4	4	4	4	4	4	4		4	...	...	36
CURRANTS.																																					
1	1	1	1	1	Cannot recommend.	...	Do not cultivate.	1	1	1	1	2	1	Do not cultivate.	1	1	1	1	1	1	1	No success.	1	...	1	1	1	Failure.	1	1	1	1	No experience.	1	...	...	26
2	2	2	2	2		2		...	2	2	2	3	2		2	2	2	2	2	2	...		2	2	2	2	2		2	2	2	2		2	...	...	26
3	3	3	3	3		3		3	3	3	3	...	3		3	3	3	3	3	3	3		3	3	3	3	3		3	3	3	3		3	...	...	26
4	4	4	4	4		...		...	4	4	4	4	4		4	4	4	4	4	4	4		4	4	4	4	4		4	4	4	4		4	...	...	26
5	...	...	...	...		1		2	...	...	...	...	...		...	...	...	...	...	...	...		...	...	...	...	...		...	...	...	...		...	...	...	...
6	...	...	...	...		4		...	...	...	...	...	...		...	...	...	...	...	...	...		...	...	...	...	...		...	...	...	...		...	...	...	...
7	...	...	...	...		...		...	...	...	...	1	...		...	...	...	...	...	...	...		...	...	...	...	...		...	...	...	...		...	...	...	...
8	...	...	...	...		...		...	...	...	...	...	...		...	...	...	...	...	...	...		...	1	...	...	...		...	...	...	...		...	...	...	...

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